TAXONOMY OF SOME CHALCIDOID PARASITES (HYMENOPTERA : CHALCIDOIDEA) OF INDIA

THESIS PRESENTED FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
IN
ZOOLOGY
IN THE
ALIGARH MUSLIM UNIVERSITY ALIGARH

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Sections
1 ENTOMOLOGY
2 PARASITOLOGY
3 ICHTHYOLOGY & FISHERIES
4 AGRICULTURAL NEMATOLOGY
5 GENETICS

Ref. No... .....

Date... May, 6, 1980.

Certified that Sri Tasawwar Hussain has carried out his research under my guidence and supervision for the Degree of Doctor of Philosophy of the Aligarh Muslim University, Aligarh. The work amounts to an original contribution and is a distinct addition to the existing knowledge on Indian Chalcids (Chalcididae). It contains some new and important observations. He is permitted to submit the work for the award of Ph.D. Degree of the Aligarh Muslim University, Aligarh.

(MAN MOHAN AGARWAL)
Reader.

C O N T E N T S

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Tasawwar Husain

INTRODUCTION

Interest in systematics of Chalcids can be traced back to 1758 with the publication of the 10th Edition of "Systema Naturae". Recognition of the principles of binomial nomenclature enthused further energy among the naturalists, and the number of species increased manifold. These studies gained further impetus when their Economic significance also came into the light. Imms (1965) observed that "the bulk of its species are either parasites or hyperparasites of the insects and are of even greater economic interest than those of Ichneumonidae, as a natural means of control", because "parasites when present exert some influence on the population of host species, particularly in every field and habitat where insect pests can occur".

Chalcids have a wide host range from Hemiptera, Orthoptera, Hymenoptera, Diptera, Coleoptera to Lepidoptera. Majority of Chalcididae parasitise Lepidoptera. Boucek (1951) recorded Hockeria mexicanillarum (Silv.) from Strepsiptera and Brachymeria columbiana (Howard) from Pseudococcus citri Risso (Hemiptera). Steffan (1959) observed Hockeria graffi Ratz. attacking ant-lions. Very few species attack and destroy beneficial insects belonging to Ichneumonidae and Braconidae and Chalcididae.

In India little attention has been paid to the systematics of Chalcidoidea in general and family Chalcididae in particular. After Mani's catalogue of 1938, of late some valuable contributions have appeared on the systematics of Chalcidoidea. Some of the principal contributions are: Alam (1956, 57 - Aphelinidae and Encyrtidae); Agarwal (1963 - Aphelinidae; 1964 - Encyrtidae); Hayat, Alam and Agarwal (1972 - Encyrtidae); Shafee, Alam and Agarwal (1973 - Encyrtidae); Mani, Dubey and Saraswat (1972-73 - Chalcidoidea); Farooqi (1976); Narendran (1977); Khan, Yunus (1978 - Eulophidae, Trichogrammatidae and Aphelinidae); Boucek, Suba Rao and Farooqi (1978 - Pteromalidae); Agarwal, S. (1979) and Khan, Majid (1980 - Encyrtidae).

The only consolidated account on Chalcididae (Brachymeria Westw.) is that of Joseph, Narendran and Joy (1975).

The present contribution is a sequence to further the cause of systematic studies on Indian Chalcids, with special reference to family Chalcididae. 9 genera and 36 species have been studied and described in detail. Of these one genus Nautainania gen.n. and 33 species are reported new. The genera studied are - Brachymeria Westw.; Nautainania gen.n.; Hockeria Wlk.; Ninnohockeria Habu; Antrocephalus Kirby; Tainania Wasi; Euchalcidia Wasi; Dirhinus Dalman and Epitranus Walker.

Already existing keys to the species of the genera have been enlarged and revised to accomodate some recent records of the new species. New keys have been proposed for Tainania, Hockeria, Euchalcidia and Anitrocnus. Some new combinations have also been suggested for misplaced species.

The parasites have been reared from the following Lepidopterous hosts:

Anisocera sp.: Pieris brassicae L.; Tyspanisia sop.: Parnara mathias Fabr.; Spodoptera litura; Chilo simplex Butl.; Luzonhera perticella Rag.; Leucinodes orbonalis G.; Margaronia trapezalis Guen; Brachmia kibinei Stn.; Xyscliphron achromhanen Meyr.

REVIEW OF LITERATURE

Linnaeus (1758) was the first to describe some Chalcid species and placed them in the genus Cynips. He was soon joined by Fabricius (1775) to include some well known genera in the family Chalcididae: Sphex (S. ajacus L.), Vespa (V. minuta L.), Crab (C. ferrorata F. 1775) and Chrysis (Ch. ajacus F., 1775). Dalman (1820) for the first time isolated the family Pteromalini. Walker (1835) included Smicra Spin., Epitranus Wlk., Mirhinus Dalm., Chalcis F., Halticella Spin., Hockeria Wlk. and Notanmis Wlk. in chalcididae. Tribe chalcidites earlier proposed by Latreille (1825) was raised to the status of the family - Chalcididae by Westwood (1840), who also devided the family into five tribes: Chalcides Westwood, Eurytomides Westwood, Spalangides Westwood, Eulophides Westwood and Encyrtides Westwood. Foerster (1856) separated Eurytomids, Spalangids, Pteromalids, Encyrtids and Eulophids from the family chalcididae raising them to distinct family status. His family chalcididae included 4 genera: Mirhinus Dalman, Smicra Spinola, Chalcis Fabr. and Halticella Spin. Walker (1871) adopted Westwood's (1840) system of classification adding Conura Spin., Phasgonophora Westwood Chalcitella Westwood, (placed in the tribe Stichel, 1856). Kirby (1884) enumerated 32 genera keeping Axima Wlk. out of the scope

of family chalcididae. Besides 16 new genera described by Kirby along with their type species, other notable additions were: Spilochalcis Thoms. Aramasrion Hal., Euchalcis Duf., Hybothorax Ratz., and Hirneta Wlk. Allocera Rich. was considered in synonymy with Euchalcis Duf.

Thomson (1875) set aside the European scheme of classification and suggested family Pteromalidae for chalcididae. He denoted chalcididae to the rank of a tribe - Chalcidini of the family Pteromalidae. Howard (1896) re-established the family chalcididae erecting twenty subfamilies. He further grouped them into - Microcentrini (3-4 jointed tarsi) and Macrocentrini (5 jointed tarsi). Howard considered only 8 genera under chalcididae: Smicra Spin., Spilochalcis Thoms., Acanthochalcis Cam., Haltichella Spin. and Notaspis Wlk. He, however, erroneously placed Podagrion Spin. on the solid ground of having strong and thick hind femur.

Dalla Torre (1898) added 6 genera: Cachorrnha Kriechb., Diplodonta Ashm., Metadonta Ashm., Blepharipa Holmgr., Kriechbaumerella D.T. and Notaspis Wlk. Thus raising the total number of genera described under chalcididae to 37. Kieffer (1904) suggested a key to the genera of subfamily chalcidinae comprising 13 genera including 8 new ones.

Ashmead (1904) summarized all the previous contributions on the taxonomy of chalcids and was the first to propose the superfamily Chalcidoidea for the family chalcididae. He re-established 13 families for the subfamilies. The family chalcididae included 2 subfamilies - Leucospinae and Chalcidinae. Chalcidinae was further divided into 5 tribes viz., Chalcidini (11 genera); Smicrini (21 genera); Haltichellini (16 genera); Chalcitellini (3 genera) and Virginini (3 genera).

Schmiedeknecht (1909) reproduced Ashmead's keys almost unchanged with some additions based on Dalla Torre's catalogue. Total number of genera studied by him rose to 71. Important aspect of his contribution was that he isolated 2 new subfamilies Leucospinae and Cupelminae and denoted the taxonomic categories to the rank of family chalcididae.

Gahan et Fagan (1923) reviewed the 'chalcid wasp type' species based on available data. They also suggested new names for the tribes and subfamilies of chalcididae. Handlirsch (1925) classified chalcids into 22 families adding 7 new ones.

Masi (1929) described 11 genera including 9 new genera viz., Stenochalcis Ms., Tainania Ms., Tainaniella Ms., Sabatius Ms., Sabatiella Ms., Malambrunia Ms., Euchalcidia Ms., Eugastrochalcis Ms. and Dremochalcidia Ms. and 14 new species of the Oriental region. In 1930 he was the first to suggest a

change in the name of subfamily chalcidinae to subfamily Brachymerinae. Later (1935-37) he revised the tribal nomenclature suggesting Brachymerini for Chalcidini and Chalcidini for Smicrini. In 1947 a new tribe Anlorhinini was suggested for his new genus Anlorhinus Ws. described earlier in 1923-25.

Burks (1936) divided the subfamily chalcidinae into five tribes - Brachymerini, Virhinini, Haltichellini, Chalcidini and Epitranini. In 1940, in his revision of chalcid flies of the tribe chalcidini in America North of Mexico, he described 5 genera and 47 species including 13 new species. In 1951 he promoted the tribes to subfamily level and thus classified the family into 5 subfamilies - Haltichellinae, Brachymerinae, Virhininae, Chalcidinae and Epitraninae. In 1960, he revised the genus Brachymeria Westw. in America North of Mexico and discussed 20 species including 7 new ones.

Schmitz (1946) described 2 new genera viz., Hantium Schmtz. and Afrochalcis Schmtz. and 13 new species from the Ethiopean region. The change in terminology offered by Gahan and Fagan (1923) was, however, not acceptable to him.

Steffan (1948-59) made some important and significant contributions to the study of chalcididae by describing 26 genera and one hundred thirty species, out of which 12 genera and 42

species were new. His key to European genera of Haltichellinae works out at well.

Boucek (1951) adopted the same classification as that of Burks (1951) in his first revision of the European species of the family Chalcididae. His excellent illustrated account included 17 genera and 58 species of which 16 species were described as new. His keys are based on distinct characters.

Nikolskaya (1952) in her monumental work on the chalcid fauna of USSR discussed 16 genera spread over 80 species of the Palaearctic region. This contribution of her's was soon followed by another magnificent account (1960a) - Chalcididae and Leucospidae of Middle Asia covering 20 genera and 90 species including 3 new genera viz., Varzobia Nik., Tenkalochalcidia Nik. and Neohybothorax Nik. and 33 new species. In yet, another critical study (1960b) of the 'Fauna of USSR' of Chalcidinae and Leucospidae she recorded 30 genera and 125 species of Chalcididae. Besides putting tremendous effort in making detailed descriptions and excellent drawings, her analysis of the literature is exhaustive.

Habu (1960, 62), 'Fauna Japonica' chalcididae, leucospidae and Podagrionidae, described 40 species supported by excellent drawings and valuable keys to the species of Japan.

Peck (1963) in his catalogue of Nearctic Chalcidoidea listed 12 genera and 97 species of chalcididae along with their synonyms. Peck, Boucek and Hoffer (1964) - Keys to the subfamilies, genera and species included 20 genera and 35 species belonging to Czechoslovakia. The key is based on stable and sound characters and runs well.

Bryanzin (1979) is a valuable attempt to put forth the keys to the identification of Hymenoptera of Palaearctic region. The keys to genera of chalcidoidea incorporate 20 genera and 50 species mainly based on findings of Nikolskaya (1952 1960a & 1960b).

Burks (1979) - 'Catalogue of Hymenoptera in America North of Mexico' has discussed at length the change of names by Gahan and Fagan (1923) and their subsequent usage in nomenclature. His catalogue contains 12 genera and 102 species of chalcididae.

From India the earliest known chalcid was a new species - Chalcis nodagrica recorded from Bombay by Fabricius in 1787. Later Walker described Chalcis ambius in 1846, Chalcis nigrorufa in 1852 and Cameron added Chalcis scantria in 1897 from Bombay. Except for C. nigrorufa all the species have now been synonymised with Brachymeria nodagrica (Fabr.) by Boucek (1972). Cameron (1906) added another species - Brachymeria ornatinea. Rama Krishna Ayyar recorded (1924, '25, '27) - B. minuta (Linne.), B. ornatinea

(Cam.) and Chalcis argentifrons respectively. Rani (1929) described Stenochalcis quadridentata, Euchalcidia crassicornis Ms. from Assam and Bengal. Hockeria atra Ms.from Puri (Orissa). Dinostmochalcis brevicoxa Ms.- from Bhagalpur and Bengal. Ghorpadi and Mahabar (1950) recorded Brachymeria excarinata Gahan from South India.

Rani (1936) described 3 new species. In 1937 in his Catalogue of Indian Insects - Chalcidoidea he recorded 78 species, spread over 24 genera. Period of 1939-1960 saw very little activity on systematic of Chalcididae. Kerrich and Nixon (1949) transferred 14 species of Chalcis to Brachymeria Westw. and confirmed Halticchalis bisignosa F. as type species of the genus Hockeria Wlk. They also corrected the misplaced genus Marran by transferring it to subfamily Brachymerinae.

Rani and his colleagues - Saraswat, Dubey and Kaul have come out with some very useful contributions on Chalcidoidea in general (1972-78) where in they have described 15 genera and 32 species, of which 29 species are described as new and the other 3 have been redescribed.

Joseph, Narendran and Joy (1970-75) in their monographic studies of the genus Brachymeria Westw. of the Oriental region have described 42 species from India. This infact is the only reliable illustrated account on Indian Brachymeria.

Recently Narendran (1977) has discussed the systematic position of the genus Tainenia with reference to Antrocephalus.

Realising the significance of genitalia as an important taxon, indicated for the first time by Alam (1956, 57) for Aphelinids and Encyrtids and later endorsed and established by Agarwal (1964, 66, 70, 74); Sugonjaev (1960, 64, 66); Farooqi (1970, Thesis); Hayat, Alam and Agarwal (1972); Shafee, Alam and Agarwal (1975); Khan, Y. (1978, Thesis); Agarwal, S. (1979, Thesis); Khan, M. (1980, Thesis); Farooqi (1976) in a bold attempt establishing the subgenital plate and components of female and male genitalia as stable diagnostic characters at the generic level. His findings are based on a comparative study of Brachymeria Westw., Dirhinus Dalm., Dirhinoidea Ms., Arrhenocera Kirby, Chalcis F., Antrocephalus Kirby and Euchalcidia Ms. These characters apply very well for the generic diagnosis of the species studied by the present writer.

MATERIAL AND TECHNIQUE

Field survey for the collection of parasitised hosts were carried out during March to May and July to November in the plains and during September and October on high attitudes (Srinagar).

Infected hosts along with a portion of the host plant were put in rearing jars measuring 6" x 3". The open end of the jar was covered with a fine muslin cloth held by a rubber band. In case of lepidopterous hosts fresh food was given every 24 hours. Each jar carried a tag bearing date of collection, place of collection, host plant, host insect. Dates of emergence of parasites recorded every 24 hours.

Emerged parasites were transferred to collection vials (2" x ½") and preserved in 20% alcohol.

For making gross morphological study card mounts were prepared. Permanent balsam mounts of various parts of the parasites were also made following the conventional system of dehydration and clearing. This facilitated making detailed microscopical observations of various parts of the body of parasites. Lactophenol proved a good clearing agent for making gross studies.

Drawings of required structures were done with the help of Camera Lucida. Measurements of the whole insects as well as their body parts were done in millimeters with the help of an ocular micrometer.

The terms used in the text and the procedure observed for the description of a species are as under:

Observations on the head which is usually oblique in chalcididae, are made in dorsal, lateral and frontal (facial) views (A1-A3). In dorsal view the arrangement of the ocelli- acute or obtuse angled triangle, the distance of the basal ocellus from eye rim (a), distance of basal ocellus from occipital margin (b) and the width of the ocellar area is measured as distance between inner rims of basal ocelli (c). Area below the front ocellus and above the clypeus is frons. Area just above the antennal sockets, which is more or less concave is called scrobe cavity (sc), which is sometimes very deep as in Brachymeria or very shallow as in Spitrannus. The scape (S) of antennae are lodged in this depression. Space between inner rim and margin of scrobe is known as parascrobal (Ps) space and its width is measured between the eye rim and base of antennal sockets. Between the antennal sockets (toruli), sometime there is a distinct projection known as inter - antennal projection. Frons sometimes has a preorbital (A$_1$ -

pre)-carina on each side close to compound eyes (eg. Antrocephalus and Tainania). In some cases it is continued around the ventral eye margins as post orbital carina (A_3-PO). Height of malar space is measured from the ventral (lower) margin of eye to the fronto-genal angle (upto base of mandible) and compared with major axis (length) of eyes (A_3-ms). Subfamily Myrmininae (Fig. A_4-h) is characterised for having a pair of 'horn like' projections on the dorsal area of frons. Their length is measured from apex upto the outer margin of front ocellus.

Basal funicular segment following pedicel is termed annellus (Fig. A5-an).

First segment of the abdomen and posterior part of metathorax are fused into a distinct sclerite-Propodeum. In Anitranines, Haltichellines and Myrmininae it has some regular primary carinae which are systematically arranged. The median carina is in the middle; the submedian carinae near the median; the sublateral-near lateral surface; the accessorial-between submedian and sublateral. Areas between carinae (Anitranes) are labelled areolae and numbered a1 - a8 (after Steffan, 1957) (Figs. A6).

Sub marginal vein is measured from the wing base upto the first point it touches the wing margin (sm), marginal (ma)

upto the level of bifurcation from postmarginal (pm) and stigmal (st) and post marginal and stigmal vein from the point of bifercation upto their free ends as in Fig. (A7).

Coxae of hind legs are strikingly large, with (Fig.A8) or without inner-ventral tooth (te). Hind femora are strongly thickened (Family character), at the ventral margin with simple dents (Brachymeria, Fig. A9). or with large lobe dent along which stretches a fine comb of minute denticulations (Dirhininae and Haltichellinae, Fig. A10). The hind tibiae end either obliquely truncated or run out into a spine ventrally, when they have only one spur (Brachymerinae) or apparently none (Chalcidinae, Dirhininae) or they are at the end more or less truncate, with 2 spurs (Haltichellinae) (Fig. A10).

The second abdominal segment proper in developed into petiole which may form a minute ring (Brachymerinae, Haltichellinae), more conspicuous (Dirhininae), sometimes considerably elongate (Chalcidinae, Epitranninae). It usually has 4-6 longitudinal carinae on dorsal surface.

The remaining part of the abdomen is gaster (Fig. A11). The first tergite is often large, bell shaped, either rounded or emarginate at apex. It has sometimes a pit on its base, the fovea or bears a number of carinae which varied from 2 to many. The following tergites 2-5 are progressively shorter. The

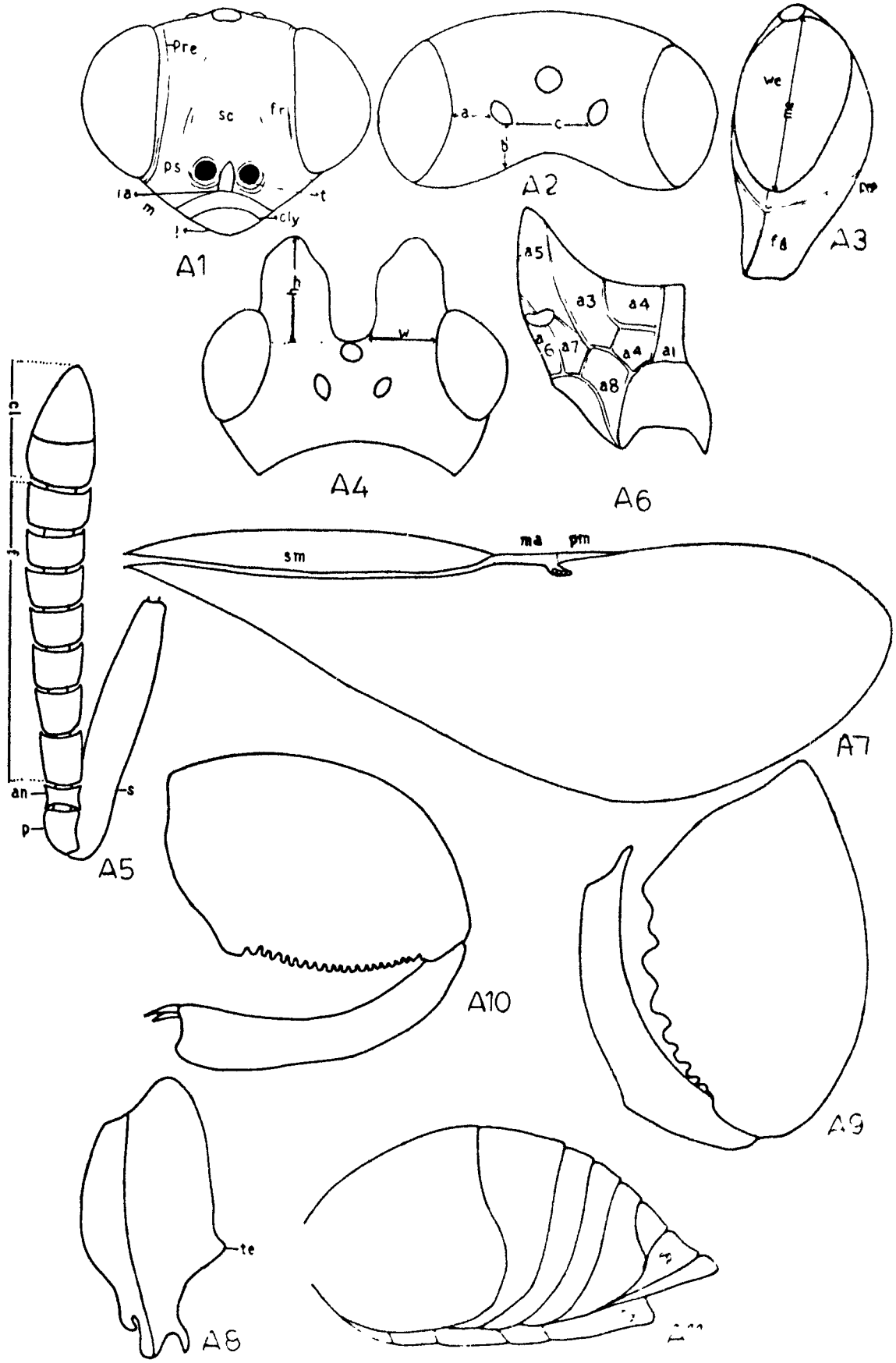
epipygidium (ep) is a formation composed of two fused tergites (7th and 8th tergites). There are 5 (♀), 7 (♂) sternites. In female last sternite is prolonged and is termed subgenital plate (Hypopygium)(hy). The term accuminate is used for pointed condition of the gaster.

Types have been deposited with the Zoology Museum, Department of Zoology, A.M.U., Aligarh, India.

A_1 = Head (facial view)
A_2 = Head (dorsal view)
A_3 = Head (lateral view)
A_4 = Head (Mixhinus) in dorsal view
A_5 = Antenna
A_6 = Prothoracic (Meitranus)
A_7 = Fore wing
A_8 = Hind coxa (Brachymeria)
A_9 = Hind leg (Epitranimae)
A_{10} = Hind leg (Haltichellinae)
A_{11} = Gaster

Abbreviations: a = distance between basal ocellus and eye rim; b = distance between basal ocellus and occipital margin; c = width of ocellar area; f = funicle; h = height of horn; l = labrum; m = height of malar space; p = pedicel; s = scape; t = torulus; w = width of horn

a1 - a5 = areolae; an = annellus; cl = club; cly = clypeus; epy = epipygidium; fg = fronto-genal suture; fr = frons; hy = subgenital plate (hypopygium); ia = inter-antennal projection; ma = marginal vein; me = major axis of eye; pm = post marginal vein; po = post orbital carina; pre = pre orbital carina; ps = paraserobal space; se = serobe cavity; sm = submarginal vein; st = stigmal vein; te = tooth; we = width of eye.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Key to the subfamilies of the family Chalcididae

1. Abdomen without a distinct petiole; hand of normal form....2

— Abdomen with a distinct petiole.....3

2. Antennal sockets situated more or less remote from clypeus; hind tibiae obliquely emarginate at apex, ventral side prolonged.....Brachymeriinae

— Antennal sockets situated usually near clypeus; hind tibiae truncate at apex, not spinously prolonged..... ..... Haltichellinae

3. Head without horns..... 4

— Head with a pair of horns.....Dirhininae

4. Antennal sockets situated below the level of lventral margin of eyes; petiole longitudinally carinate, anterior margin not laminate..... Epitranimae

— Antennal sockets situated above the level of ventral margin of eyes; petiole not carinate on dorsal side, anterior margin laminate..... *Chalcidinae

Subfamily Chalcidinae

Head without horns on dorsal part of frons; antennae inserted usually in centre of frons, near clypeus; hind tibiae entirely arcuate, spinous at apex, with one weak short spur near apex; abdomen with distinct petiole, petiole laminate on anterior margin.

According to Mahrioins (1904) all the species of this subfamily are referable to the section "Chalcidine Petiolate" of the genus Chalcis. The subfamily is limited to a single genus Chalcis as defined by Westwood, 1840. Most authors have treated this group as the genus Smicra or Amicra. Gahan et Fagan (1923) showed that Smicra (Amicra) minola and Chalcis Fair. are isogenotypic , the genus formerly called Smicra took the name Chalcis instead and the genus were referred to Brachymeria. Ashmead (1904) formulated a tribe Smicrini and included in it along with Smicra a large number of other genera. With the change in the name of the genus the name of the tribe has also been changed accordingly to Chalcidini. The name Chalcidini is almost identical with Smicrini of Ashmead. Kieffer (1904) added a new genus Calliamicra. Masi (1929) added a new genus in this tribe Stenochalcis. Burks (1940) made a comprehensive study of the tribe and recorded 5 genera and described 47 species including 13 as new from America North of Mexico.

Boucek (1951) gave an illustrated account of 2 genera and 4 species from the Europe. Nikolskaya (1952) recorded 2 genera and 4 species from USSR. Nikolskaya (1960a) recorded the genus Chalcis along with 3 species from Middle Asia. In 1960(b) she described Chalcis and Euilechalcis with 4 species from USSR. Kalu (1960, 62) also recorded Chalcis and Euilechalcis from Japan and described 2 species. Peck et al. (1963) described 4 genera and 53 species from Nearctic region. Peck (1964) recorded Chalcis and Euilechalcis with 4 species. Nikolskaya in Tryapitzin (1978) is a repetition of her earlier contribution of 1960(b). Burks (1979) described 3 genera and 53 species.

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* Subfamily Chalcidinae has not been included in the present work.

Subfamily Brachymerinae

Subfamily Brachymerinae is characterized for the following characters:

Head without horns on dorsal area of frons; antennae inserted at or above ventral margin of eyes, never approaching near clypeus; hind tibiae with one apical spur, obliquely minute, truncate at apical dorsal side, no apical and ventral margins forming spurs projection; petiole very short.

Genus Brachymeria was established by Westwood in 1829. Chalcis minuta Linne, 1776 was designated as its genotype by Westwood in 1840. Ashmead in 1904 formulated the tribe Chalcidini. Due to the change in the name of genotype, the tribe was renamed Brachymerini and subsequently promoted to subfamily Brachymerinae by Burks in 1951.

The subfamily stands divided into 3 tribes:

1. Cratocentrini Steffan
2. Phasganophorini Steffan and
3. Brachymerini Steffan

Tribe Cratocentrini and Phasganophorini have been extensively studied by Steffan. In 1958 he gave a list of synonyms and new combinations. In 1959 in a comprehensive

study be described 4 new genera viz., Philocentrus, Anatocentrus, Acrocentrus and Vasmorcrobe. Thus raising the total number of genera to 8. He also described 17 species including 6 new ones.

Tribe Phaenomphorini was divided into two groups by Steffan (1950):

1. Group Phaeganophora: including viz., Phaenomphora Latr., 1832 and Trimmura Stehl., 1865 (= Bactrochalcis Kieffer, 1911 = Centrochalcidea Cahan et Fagan, 1923) and
2. Group Stypiura: containing viz., Stypiura Kirby, 1883 (= Maculocalina Kirby, 1883); Parastypiura Steffan, 1950; Hexachalcis Cameron, 1911 and Stenochalcis Mani, 1929.

Tribe Brachymerini

Tribe Brachymerini is characterized by:

Head not deeply concave on occiput, nor swollen on frons; ventral side of scrobe cavity not widely remote from ventral margin of clypeus; fronto-genal sutures more or less carinate; thorax distinctly convex; forewings with post-marginal vein shorter than marginal vein; hind tibiae with one spur at apex; gaster not strongly prolonged posteriorly.

Tribe Brachymerini contains only one genus Brachymeria Westwood which is further split into 5 sub genera:

1. Brachymeria Westwood
2. Neobrachymeria Masi
3. Hatsumurameria Habu
4. Gabanula Burks
5. Pseudobrachymeria Burks.

Ruschka (1922) described 12 species from Europe. Boucek (1951) synonymized B. taurensis Ms. with B. secundaria Rusch. Kerrich and Menon (1949) transferred 14 species of Chalcis to genus Brachymeria.

Nikolskaya (1952) described 18 species of which 5 were new. In 1960(a) she described 14 species including 9 new species. In 1960(b) she recorded 22 species from USSR. Steffan (1955) described 2 new species from Belgium- Congo. Burks (1960) recorded 27 species with 8 new species from America North of Mexico. Habu (1960, 62) recorded 14 species with 5 new ones from Japan.

Peck (1963) in his catalogue of Nearctic Chalcidoidea described one species of genus Acanthochalcis, one species of Phasganophora Westwood, 6 species of Trigonura Sichel and 19 species of Brachymeria Westwood. Peck et al. (1964) in their

keys to the Chalcidoidea of Czechoslovakia included 11 species of Brachymeria Westwood.

Joseph et al. (1970-75) in their revision to the genus Brachymeria Westwood from the Oriental region described 64 species including 21 new species and 7 new subspecies. Mani and Dubey (1975) described 2 species of Trigonura Sichel.

Farooqi (1976) has made a gallant attempt to differentiate 13 species of Brachymeria on the basis of subgenital plate and valvifers.

Narendran (1978) described a new species from Papua New Guinea. Nikolskaya in Tryapitzin (1978) described 10 species from European part of USSR.

Burks (1979) in 'Catalogue from America North of Mexico' listed a single species of genus Acanthochalcis, one species of Phasganophora, Westwood. 7 species of Trigonura Sichl. and 20 species of Brachymeria Westwood.

Genus Brachymeria Westwood

Genotype : Chalcis minuta Linne (desig. Westwood, 1840)

Chalcis of authors, not the type species : Walker, 1835: Entom. Mag. 2: 17 .- Foerster, 1856: Hym. Stud. 2: 20, 21, 29 .- Sichel, 1865: Ann. Soc. Ent. Fr. 5: 347.- Cresson, 1872: Trans. Amer. Ent. Soc. 4: 59 .- Thomson, 1875: Skand. Hym. 4: 17 .- Cameron, 1884: Biol. Cent.-Am., Ins. Hym. 1: 99 .- Kirby, 1894: Journ. Linn. Soc., London, 17: 65. - Howard, 1895: Bull. U.S. Dept. Agr., Bur. Ent. 5: 36. - Howard, 1896: Ent. Amer. 1: 215 .- Cresson, 1897: Trans. Amer. Ent. Soc., Suppl. 67: 234.- Dalla Torre, 1898: Cat. Hym. 5: 385.- Kieffer, 1904: Berl. Ent. Zeitsch. 49: 247 .- Ashmead, 1904: Mem. Carnegie Mus. 1: 249. - Schmiedeknecht, 1909: Gen. Ins. Fasc. 9: 19, 20, 25.- Crawford, 1910: Tech. Ser. 19, U.S. Dept. Agr., Bur. Ent.: 13.- Viereck, 1916: Bull. 22, Conn. Geol. Nat. Hist. Sur. : 526.- Ruschka, 1922: Konowia: 221.

Brachymeria Westwood, in Stephens, 1829: Nomenel. Brit. Ins.: 36.- Stephens, 1829: Syst. Cat. Brit. Ins., Pt. I: 383.- Westwood, 1832: Phil. Mag. Ser. 3(I): 127.- Westwood, 1840: Synopsis Gen. Brit. Ins.: 66.- Girault, 1915: Mem. Queensland, Mus., 4: 314.- Gahan et Fagan, 1923: Bul. 124, U.S. Natl. Mus.: 24.- Waterston, 1923: Bul. Ent.

Res. 14: 103.- Gahan et Fagan in Leonard, 1928: Mem. 101, Cornell Univ. Agr. Expt. St.: 976.- Mercet, 1925: Rev. Fitopat. 1(1): 12.- Masi, 1929: Mem. Soc. Ent. It. Genova, 8: 114.- Blanchard, 1935: Soc. Ent. Argentina, Rev. 7: 103.- Masi, 1935: Boll. Soc. Ent. Ital. 67(3): 118.- Ishii, 1950: Kontomia, 2: 88 .- Robert, 1933: Tech. Bull. U.S. Deptt. Agr. no. 365: 1.- Dowden, 1935: Journ. Agr. Res., 50: 495.- Burks, 1936: Trans. Ill. Acad. Sci. 29: 251.- Kamal, 1937: Bull. Soc. Ent. Egypt, 21: 5 .- Drimely, 1938: Ins. N. Car.: 421.- Cherian and Bunheer, 1939: Proc. Ind. Acad. Sci. 77(B): 289.- Schmitz, 1946: Expl. Parc. Nat. Albert, Mis. De Witte, fasc. 48: 17.- Ghesquiere, 1946: Rev. Zool. Bot. Africaines, 39: 372.- Kerrich and Menon, 1949: Ent. Month. Mag., 85: 207.- Masi, 1950: Soc. Ent. vol: 27.- Fullaway, 1950: Proc. Hawaii, Ent. Soc., Honolulu, 14: 63.- Steffan, 1950: Bull. Soc. Ent. Fr., 60: 146.- Peck in Muesebeck et al., 1951: Monog. 2, U.S. Dept. Agr.: 586.- Boucek, 1951: Acta. Ent. Mus. Nat. Prag. 27 (Suppl.): 17 .- Nikolskaya, 1952: Akad. Nauk. USSR, Fauna USSR, 44: 86.- Erdos, 1955: Fauna of Hungary, V. 12, No. 2, (Hym. II): 11 .- Burks, in Krombein et al. 1958: Monog. 2, Suppl. U.S. Deptt. Agr.: 83.- Steffan, 1958: Entomophaga: 275.-

Steffan, 1959: Cahiers des Nat.(n.s.), 15: 35.- Habu, 1960: Bull. Nat. Inst. Agr. Sci. (Japan), ser. C. 11: 142.- Nikolskaya, 1960(a): Akad. Sci. CCCP, 27: 1.- Nikolskaya, 1960(b): Zool. Inst. Akad. Nauk., New Series, no. 76, 5: 65.- Burks, 1960: Trans. Am. Ent. Soc. 86: 225.- Habu, 1961: Kontyu, 29: 273.- Habu, 1962: Fauna Japonicae: 12.- Habu, 1966: Kontyu,34(1): 22.- Chotani, 1966: Journ. Zool. Soc. Ind. 18: 89.- Joseph et al. 1973: Zool. Monog. No.I., Dept. Zool., Univ. Calicut, India: I.- Farroqi, 1976: Orient. Ins. 10(3): 393.- Nikolskaya,(1978: Opred Faune CCCP, no. 12, pt. 2, vol. III: 45.- Narendran, 1978: Orient Ins. 12(2): 201.- Burks, 1979: Cat. Hym. Amer. N. Mexico, 1: 870.

Synonyms:

Brachymeria Westwood in Stephens, 1829: Nomenel. Brit. Ins. 1:56.

Chalcis Walker (nec Fabricius), 1834: Ent. Mag. 2: 27-28.

Oncochalcis Cameron, 1904: Entomologist, 37: 161.

Genotype: Oncochalcis marginata Cameron (monobasic)

Tumidicoxa Girault, 1911: Zool. Jahrb. Abt. f. System. 31:378.

Genotype: Tumidicoxa nigra Girault (Orig. desig.)

Cevxia Girault, 1911: Zool. Jahrb. f. system. 31: 382.

Genotype: Cevxia fuminennia Girault (Orig.desigm.)

Pseudenitelia Girault, 1913: Canad. Ent. 45: 104.

Genotype: Pseudenitelia rubrifemur Girault (Orig.desig.).

Brachenitelia Girault, 1913: Canad. Ent. 45: 106.

Genotype: Brachenitelia rubrinea Girault (Monobasic).

Tumidicoxella Girault, 1913: Trans. Roy. Soc. Sth. Austral.37:74.

Genotype: Tumidicoxella nigricoxa Girault (Orig. desig.).

Tumidicoxoidea Girault, 1913: Arch. Naturg.Jahrg. 79A(6): 67.

Genotype: Tumidicoxoidea kurundaensis Girault (monobasic).

Head ovate in profile, more or less rounded in ventro-front view: compound eyes large: scrobe cavity deep, smooth, margins carinate: fronto-genal sutures well carinate, often branching pre- and post orbital carinae: labrum rather large, semi circular: right mandible with 2 or 3 teeth, left bidentate: pronotum without fringe of hair: apex of scutellum simply rounded, emarginate or bilobed: propodeum short, strongly declined posteriorly, distinctly carinate, carinae irregular: wings hyaline or faintly smoky:postmarginal vein rather long: hind femora well developed , outer-ventral margin with simple sparse teeth: gaster sessile.

Key to subgenera of the genus Brachymeria Westwood

1. Fronto-clypeal suture distinct.....2

-- Fronto-clypeal suture incomplete or wanting, the clypeus either incompletely or completely fused with face.....Katsuyamameria Habu

2. Gaster elongate, usually strongly acuminate at apex, tergite II broadly and deeply emarginate on meson, sometimes terga III and IV also emarginate on meson; antennae inserted at level of ventral margins of compound eyes.....3

-- Gaster short, truncate or subtruncate at apex, posterior margin of tergate II-IV straight on meson; antennae inserted above level of ventral margin of compound eyes.....Brachymeria Westwood

3. Scutellum lacking a median elevation.....4

-- Scutellum with an elevation in the middle ....Gahanula Burks

4. Vertex with a transverse carina extending across, just posterior to front ocellus, this carina extends downward on either side of frons.... Pseudobrachymeria Burks

— Vertex lacking a transverse carina...Neobrachymeria Mani

The present work includes descriptions of 2 new species belonging to the subgenus Matsumuramyria Habu and 6 new species of subgenus Brachymeria Westwood. B.(B.) lasus (Walker) has been redescribed in further details.

Key to species of the genus Brachymeria Westwood from the Oriental region proposed by Joseph et al. (1975) has been revised and enlarged to accomodate new species.

Key to species of the genus Brachymeria Westwood

1. Clypeus partly or completely fused with the face.....
.....Subgenus Katsumurameria Habu - 2

-- Clypeus not fused, separated by a suture.....
.....Subgenus Brachymeria Westwood - 7

2. Post orbital carinae absent.....3

-- Post orbital carinae present.....4

3. Scutellum without unpitted space in the middle; hind tibiae yellow in the middle; gaster liver brownish red....
.....B. (M.) lyncuiae Kohl.

-- Scutellum with unpitted space in the middle; hind femora reddish in the middle; gaster black.....
.....B. (M.) rufotibialis sp.n.

4. Hind tibiae completely yellow.....5

— Hind tibiae black or reddish; fronto-clypeal suture almost complete but not so distinct as in true Brachymeria.....6

5. Clypeus distinct and raised dorso-medially, but fused laterally; punctures on the thorax extremely small with interspaces wide and shining.....
.....B. (M.) nitida Joseph et al.

— Clypeus fused dorso-medially, only smooth short ante-clypeus visible.....B. (M.) taiwana Habu

6. Pre orbital carinae distinct; scape longer than 1-4 funicle segments combined; hind femora red; gaster accuminate at apex.....B. (M.) aligarhensis sp.n.

— Pre orbital carinae absent; scape shorter than 1-4 funicle segments combined: hind femora black; gaster truncate at apex.....B. (M.) ryukyuensis Habu

7. Hind coxae with an inner ventral tooth or protuberance...8

— Hind coxae without an inner ventral tooth or protuberance.....17

8. Scutellum emarginate at apex.....9

— Scutellum not emarginate at apex.....10

9. Hind femora reddish or orange brown, apex with a small yellow patch; hind tibiae yellow with the base dark reddish and a dark brownish red band along the ventral carina on outer and inner sides; parasites of Utetheisa pulchella and Earias spp. (Lepidoptera).....
.....B. (B.) bengalensis pulchella Joseph et. al.

-- Hind femora liver brownish black with distal tips of femora faintly yellowish; hind tibiae liver brownish black with distal tip yellowish.....
.....B. (B.) dunnensis Joseph et.al.

10. Post orbital carinae not reaching geno-temporal region..11

-- Post orbital carinae reaching geno-temporal region.....12

11. Hind tibiae yellow with a blackish ventral carina from base to tip; interspaces between punctures on the thorax smooth; abdomen longer than thorax.B. (B.) intermedia Nees

-- Hind tibiae brownish-black with a yellow patch subbasally and apically; interspaces between punets on thorax rugose; abdomen shorter than scutellum.....
.....B. (B.) intermedia northetrialia Joseph et al.

12. Hind tibiae mostly black.....13

-- Hind tibiae mostly yellow with the base alone black.....15

13. Hind tibiae black with the yellow patches subbasally and apically.....14

-- Hind tibiae black with the apex alone yellow.....
.....B. (B.) nigrifemorata Joseph et. al.

14. Punctures on thorax not close, interspaces of pits as wide as the diameter of the pits on the middle of scutellum.....B. (B.) tapunensis Joseph et al.

-- Punctures on thorax close.....
.....B. (B.) coxodentata Joseph et al.

15. Postclypeus with unpitted space in the middle; lateral ridges of scrobe produced infront of antennal toruli; tergite I almost glabrous.....16

-- Postclypeus completely pitted; lateral ridges of scrobe not produced infront of antennal toruli; tergite I faintly shagreened..B. (B.) albotibialis Ashmead

16. Scape shorter than 1-4 funicle segments combined, club truncated at apex; base of hind tibiae black; gaster black.....B. (B.) lasus Walker

-- Scape as long as 1-4 funicle segments combined, club rounded at apex; base of hind tibiae reddish; gaster reddish.....B. (B.) ruforastari sp.n.

17. Scutellum slightly emarginate or rounded at apex.....18

-- Scutellum emarginate at apex.....54

18. Punctures on the scutellum close and less than half as broad as the diameter of pits.....19

-- Punctures on the scutellum not close.....50

19. Pre orbital carinae distinct.....20

-- Pre orbital carinae faint or absent.....34

20. Post orbital carinae present.....21

-- Post orbital carinae absent or indistinct.....30

21. Base of hind tibiae black or brownish black.....22

-- Base of hind tibiae neither black nor brownish black....26

22. Hind tibiae with a subbasal yellow patch.....23

-- Hind tibiae without a subbasal yellow patch.....24

23. Scape (♂) almost as long as 4-7 antennal segments combined; apex of scrobe not interrupted from front ocellus by rugose narrow area; apex of scutellum entire; parasitic on Nephantis serinopa Meyrick.....
.....B. (B.) nephantidis Gahan

— Scape (♂) shorter than antennal segments 4–6 combined; apex of scrobe interrupted from front ocellus by rugose narrow area; apex of scutellum weakly emarginate; subbasal yell w patch much smaller than the yellow patch at apex.....B. (B.) kamiloi Habu

24. Scrobe reaching the front ocellus.....25

— Scrobe not reaching the front ocellus; tibiae yellowish black except the tip being yellowish brown.....
.....B. (B.) raoi Joseph et al.

25. Hind femora black with the apex yellowish; hind tibiae black with a brownish patch apically; post orbital carinae branched; antennae (♂) with trichoid sensilla on ventral side of funicle...B. (B.) fumosta Habu

— Hind femora completely black without a yellow patch at apex; hind tibiae black with a faint brownish coloration at the tip; post orbital carinae not branched.....
.....B. (B.) manoni Joseph et al.

26. Hind tibiae with a blackish or brownish band.....27

— Hind tibiae yellow without a median blackish band but the area along the ventral carina blackish; hind femora

black except for one-fourth of its portion of its tip being yellowish.....B. (B.) kodaikanalensis Joseph et al.

27. Scrobe not reaching the front ocellus.....28

-- Scrobe reaching the front ocellus.....29

28. Scape (♀) as long as 4-6 antennal segments combined; area below scrobe not smooth; hind tibiae pale blackish brown with yellow patch at base and apex.....
.....B. (B.) wiahaaina Joseph et al.

-- Scape (♀) longer than 4-6 antennal segments combined; area below scrobe with a smooth portion in the middle; hind tibiae black with apex and base yellow.....
.....B. (B.) longiscapa Joseph et al.

29. Hind tibiae black with the base yellow and dorso-apical area brownish yellow; pretarsus twice as long as wide.....B. (B.) hima Habu

-- Hind femora and tibiae more prominently yellow at apical part than hima Habu; pre tarsus three times as long as wide; parasitic on Altava fabriciella.....
.....B. (B.) hima altavae Joseph et al.

30. Hind tibiae with base black or dark brown.....31

— Hind tibiae with base yellow or reddish yellow 33

31. Medium sized species (3-4.5 mm).....32

— Small species (1.5 - 2.0 mm.): hind femora liver-brownish, with apex pale yellow: hind tibiae liver-brownish with small yellow patch subbbasally and apically parasitic on Apanteles plutellae (Hym.).....
.....B. (B.) plutellae Joseph et al.

32. Scrobe reaching the front ocellus; hind tibiae black with yellowish patch subbasally and apically.....
.....B. (B.) excarinata Gahan

— Scrobe slightly distant from front ocellus; hind tibiae black with the base faintly reddish and yellow patches subbasally and apically.....
.....B. (B.) inermis Fonscolombe

33. Hind tibiae yellow without a median blackish band; tergite I pitted.....B. (B.) carinata Joseph et al.

— Hind tibiae yellow at almost one-third and apical one-third, reddish black at median one-third.....
.....B. (B.) abeasiensis Habu

34. Post orbital carinae present.....35

-- Post orbital carinae faint or absent.....40

35. Hind tibiae mainly black or brownish basally.....36

-- Hind tibiae with a blackish band medially, base and apex yellowish; scrobe not reaching front ocellus; apex of scutellum completely rounded.....B. (B.) secundaria (Ruschka)

36. Hind tibiae mainly yellow with the base alone black.....37

-- Hind tibiae mainly black or brownish black.....38

37. Tergite II vaguely punctured in the female, gaster short, sub acuminate.....B. (B.) sunlosaa (Westwood) (B. (B.) bearsavi, Var. xanthoterus Waterst.)

-- Tergite II with a row of distinct puncts on dorsal surface; gaster acuminate at apex, longer than thorax.....B. (B.) flavotibialis sp.n.

38. Hind tibiae with yellow coloration subbasally and apically.....39

-- Hind tibiae brownish-black with yellow coloration at distal end.....B. (B.) bearsavi Kirby

39. Scutellum weakly emarginate at apex; area below scrobe uniformly carinate without a distinct smooth area; hind tibiae mostly black except for a pale blackish-yellow patch at subbasal part and apex.....
.....B. (B.) punctifrontis Joseph et al.

-- Scutellum rounded at apex; area below scrobe smooth; hind tibiae yellow with dark brown or black at base and in the middle.....B. (B.) bunkai Ashmead

40. Hind tibiae with the base yellow.....41

-- Hind tibiae with the base black or brown.....42

41. Hind tibiae black with apex and base yellow.....
.....B. (B.) apicornis Cameron

-- Hind tibiae yellow with ventral region brownish, this coloration extending slightly to dorsal region in the middle.....B. (B.) shamshernis vietnamensis Joseph et al.

42. Hind tibiae with a median black or brownish band.....43

-- Hind tibiae without a median blackish or brownish band..47

43. Hind tibiae yellow subbasally and apically.....44

-- Hind tibiae black with the apical portion alone yellow; lateral ridges of scrobe not produced in front of

antennal toruli, hind femora black with small apical yellow spot..... E. (E.) carbonaria Zehntner

44. Somewhat large species (4.25 - 4.40 mm.); hind tibiae blackish brown with yellowish coloration subbasally and apically..... 45

— Small species (1.5 mm); hind tibiae pale yellow with black in the middle and at base; lateral ridges of scrobe not produced infront of antennal toruli; parasitic in Prodenia..... E. (E.) prodeniae Ashmead

45. Hind femora black with apex yellow, hind tibiae black in the middle..... 46

— Hind femora red with apex yellow, hind tibiae red in the middle and at the base.....E. (E.) flaviceps sp.n.

46. Scape shorter than 1-4 funicle segments combined, club as long as preceding two funicle segments combined; bases of hind tibiae black..... E. (E.) kuroki Ohbotani

— Scape longer than 1-4 funicle segments and club longer than preceding two funicle segments combined; bases of hind tibiae red.....E. (E.) semiatra sp.n.

47. Abdomen black or faintly reddish.....48

— Abdomen red; post orbital carinae faint and branched; hind femora liver-brownish with small yellow patch at apex; base and ventral margin of hind tibiae liver-brown, rest portion yellow.....B. (B.) semirufa Walk.

49. Hind femora black except apex yellow; area below scrobe smooth.....49

— Hind femora often reddish brown with blackish patches of varying sizes on outer surface and yellow at apex; area below scrobe uniformly punctate.....
.....B. (B.) jayaraji Joseph et al.

49. Pre-orbital carinae faint, vertex distinctly pitted, interspaces of pits rugose; scape not exceeding to front ocellus; tergite I shagreened.....
.....B. (B.) narrarensis Joseph et al.

— Pre-orbital carinae absent, vertex faintly pitted, interspaces of pits very narrow, somewhat carinated; scape exceeding to front ocellus; tergite I almost glabrous.....B. (B.) jasenhii sp.n.

50. Pre-orbital carinae absent or weak.....51

— Pre-orbital carinae present, post orbital carinae weak; interspaces of pits on scutellum as broad or half as

broad as the diameter of pits; hind tibiae blackish with yellow patches subbasally and apically, with base pale brownish yellow; parasitic on Eublemma amabilis from Lacifera lanca.....B. (B.) tachardiae Cameron

51. Hind tibiae mostly yellow.....52

— Hind tibiae mostly black.....53..

52. Post-orbital carinae weak, funicle segments distinctly longer than wide; hind tibiae black at base.....
.....B. (B.) nurnai Cameron

— Post orbital carinae absent, funicle segments subsquare or wider than long; hind tibiae reddish on base.....B. (B.) hydrabadiensis sp.n.

53. Hind tibiae with small subbasal and apical yellowish brown patches; preorbital carinae weak; scrobe not produced, antennae swollen at apex; scape(♀) much longer than 4-6 antennal segments combined.....
...B. (B.) thracia Crawf. or B. (B.) medicina Joseph et al.

— Hind tibiae with a yellow patch at dorso-lateral side at the distal end (without a yellow patch subbasally); lateral ridges of scrobe produced infront of the antennal torulii; area below scrobe smooth in the middle;

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* Could be a synonym, types not seen.

inter-spaces between pits narrow except in the middle of scutellum where inter-spaces are a little more than the diameter of the pits.....
.....B. (B.) nigritamularia Joseph et al.

54. Puncture on scutellum close and less than half as broad as the diameter of pits (In B. finkai Habu scutellum with a long unpitted area).....55

-- Punctures on scutellum not close, half as broad as the punctures or more than half.....74

55. Pre-orbital carinae faint or absent; post orbital carinae may or may not be present.....56

-- Pre and post orbital carinae distinct.....67

56. Post orbital carinae present.....57

-- Post orbital carinae absent; hind femora mainly red with often a black spot in the middle; hind tibiae ivory white but blackish along ventral ridges and dark basally.....B. (B.) ambiana Walker

57. Base and apex of hind femora yellow.....58

-- Base of hind femora colored.....61

58. Hind femora yellow in the median dorsal portion.....59

-- Hind femora black in the median dorsal portion (rarely yellow).....B. (B.) femorata (Panzer)

59. Hind femora with a large median blackish coloration.....60

-- Hind femora mostly yellowish with a narrow median blackish coloration.....B. (B.) ornatinas Cameron

60. Pubescence on body and abdomen golden yellow and dense; scape longer than 4-6 antennal segments combined; abdomen longer than thorax.....B. (B.) auratopubescens Joseph et al.

-- Pubescence on body silvery grey; scape not longer than 4-6 antennal segments combined; abdomen little shorter than thorax.....B. (B.) nepalensis Cameron

61. Abdomen black or faintly reddish.....62

-- Abdomen yellowish-orange colored.....B. (B.) ornatogastralis Joseph et al.

62. Hind femora red or brown with or without yellow apical spot, in some cases hind femora red with black path on outer side.....63

-- Hind femora black or reddish black with yellowish apical patch.....64

63. Hind femora reddish or brownish with yellow apical spot and in some black patch on outerside, hind tibiae yellow with the base brownish or blackish.....
.....B. (B.) bengalensis Cameron

— Hind femora red without yellow apical spot; hind tibiae blackish but merging with red basally and apically.....
.....B. (B.) alterninea Walker

64. Hind tibiae black or brown with subbasal and apical yellow patches.....65

— Hind tibiae yellow and with a black band basally; abdomen longer than thorax; large species (♀ = 7.25 mm.; ♂ = 6.50 mm.).....B. (B.) gigantica Joseph et al.

65. Post orbital carinae not branced; a yellowish patch on the base of scape.....66

— Post orbital carinae branched; scape black.....
.....B. (B.) hattoriae shillongensis Joseph et al.

66. Scutellum high and more convex in lateral view, strongly declined posteriorly.B. (B.) coloradensis Cresson

— Scutellum not high in lateral view, gently declined posteriorly.....B. (B.) hattoriae Habu

67. Hind femora black or brown with or without a tan spot apically.....68

-- Hind femora black or reddish with yellow apical spot....70

68. Hind femora ferruginous or red, without a tan spot.....69

-- Hind femora black with an apical tan spot; hind tibiae completely black; scutellum with a median carina..... .....B. (B.) lucubris Walker

69. Hind femora ferruginous with dark spot externally on disc near base; hind tibiae ferruginous with apical one-fourth yellowish white.... B.(B.) atridens Waterston

-- Hind femora light brown without a dark spot externally; hind tibiae dark brown with basal one-fourth white..... .....B. (B.) acanoxenus Fullaway

70. Hind tibiae yellowish at base.....71

-- Hind tibiae black or ferruginous at base and at middle with subbasal and apical yellowish patches.....72

71. Hind tibiae yellowish at base and apex, black or reddish black in the middle; scutellum with rather long narrow unpitted space at middle but without longitudinal carina; large species 7-8 cm...B. (B.) fiskei Crawford

— Hind tibiae completely yellow; scutellum with a longitudinal carina.....B. (B.) scutellocarinata Joseph et al.

72. Sixth abdominal tergite weakly pitted.....73

— Sixth abdominal tergite distinctly pitted; hind femora red with yellow apically; hind tibiae reddish with yellow subbasal and apical patches (in some, punctures on thorax half as broad as the diameter of pits).....
.....B. (B.) borneanus Cameron

73. Hind femora red with yellow apical patch; hind tibiae reddish with subbasal and apical yellow patches; hind femora narrow.....B. (B.) fonscolombei Dufour

— Hind femora usually black with yellow apical patch, usually extending to the innerside; hind tibiae mostly black with apical and prebasal yellow patches; hind femora comparatively wide.....B. (B.) minuta Linneus

74. Pre orbital carinae absent.....75

— Pre orbital carinae present.....76

75. Post orbital carinae absent; interspace of pits half as broad as the diameter of pits; abdomen longer than thorax, dull-red, slightly piceous..B. (B.) xerxena Walker

-- Post orbital carinae present; hind femora black except apices being rufofulvous; hind tibiae brownish black with subbasal and apical yellow patches; interspaces of pits half or as broad as the diameter of pits.....
.....B. (B.) fulvitarsis Cameron

76. Hind femora black with almost half distal portions yellow; punctures on scutellum half or as broad as the diameter of pits; parasitic on Calopepla leayana.....
.....B. (B.) minuta calopeplae Joseph et al.

-- Hind femora brownish red with yellow apically; reddish or brownish coloration on tibiae variable; punctures on scutellum widely scattered and more than the diameter of pits, interspaces of pits smooth.....
.....B. (B.) nodogrica Fabricius

Brachymeria (Natsumurameria) aligarhensis sp.n.

(Figs. 1-5)

Female:

Head black; scape and pedicel dark reddish brown, rest of antennae black; thorax black, tegulae yellow, fore and mid coxae black, femora, tibiae and tarsi blood red except bases of femora and apices of tibiae being yellowish; hind coxae and femora dark red except yellow bases, tibiae dark red on bases and ventral margin and in the middle, sub bases and apices of tibiae whitish, tarsi yellowish; gaster shining black; forewings hyaline with dark veins.

Head (Fig. 1,2).- Wider than long, slightly wider than thorax, surface fairly pitted, post clypeus with some smooth area without pits, interspaces of pits somewhat carinate; pre and post orbital carinae distinct; eyes glabrous; fronto-clypeal suture absent; scrobe cavity smooth, deeply excavated, reaching to front-ocellus, with carinated margins on ventral half; ocelli arranged in obtuse angled triangle, basal ocellus removed from eye rim by about its diameter, from occipital margin by about thrice its diameter, occipital carina short;.

Antennae (Fig. 3).- Scape short, not reaching front

ocellus, four and one-half times as long as wide (0.58:0.13), shorter than pedicel to 3rd funicle segment combined; pedicel one and one-half times as long as wide; annellus transverse funicle I subsquare, 2-7 wider than long with increase in width distad, club 2-segmented, one and one-half times as long as wide (0.26:0.18) as long as preceeding two funicle segments combined.

Thorax .- Distinctly pitted on dorsal surface, pronotum densely pitted, scutum densely pitted on anterior margin, more sparsely pitted towards apex, interspaces as wide as the diameter of pits, scapulae with few pits, scutellum densely pitted on the sides, less dense near centre with unpitted space in the middle, interspaces shining, scutellum bilobed at apex; pubescence golden.

Fore wings .- Hyaline, slightly less than three times as long as wide (2.53:0.9); submarginal, marginal, post marginal and stigmal veins 1.2, 0.45, 0.15 and 0.08 mm. long respectively; marginal fringe short.

Hind wings .- Hyaline about three and a half times as long as wide; marginal fringe short.

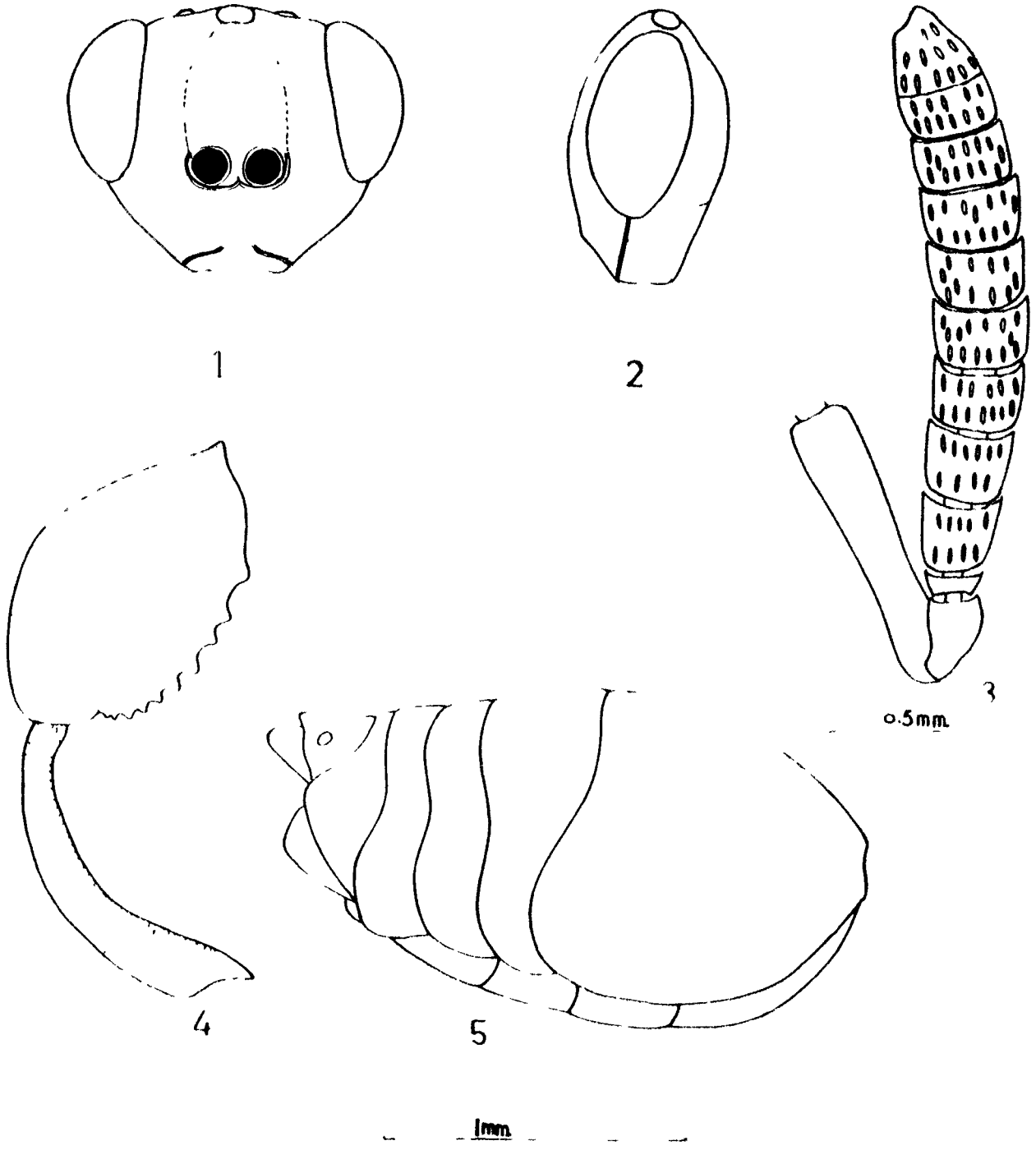
Hind legs (Fig. 4).- Coxae and femora sparsely punctate and with dense pubescence on ventral side; outer-ventral

PLATE - I

Brachymeria (Hateumurmeria) siligorhensis sp.n., ♀

(Figs. 1-5).

1. Head (Facial view)
2. Head (Lateral view)
3. Antenna
4. Hind leg
5. Gaster.


1
2
3
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4
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of femora with 10 teeth, basal tooth robust.

Gaster (Fig. 5).- Accuminate at apex, tergite I impunctate, less than one-half length of gaster, segments 2-6 glabrous on dorsal side; subgenital plate as in Fig. 46.

Female length:- 4.4 mm.

Holotype: ♀, India, Uttar Pradesh, Aligarh, ex. Eulophora sp. on Pinnum vulgaris V., 2.xi.1976 (Cat. No. Br-4?).

Brachymeria (Matsumurameria) rufotibialis sp.n.

(Figs. 6 - 10)

Female:

Head black, eyes and ocelli light brown, antennae black except basal half of scape liver- red; thorax black, tegulae yellow; fore and middle legs liver red on coxae, basal half of femora and a small patch on ventral margin of tibiae, rest yellow; hind legs reddish on coxae, femora except apex, tibiae at base, in the middle, continued on ventral margin towards apex, apex of femora, tibiae on apical and subbasal region and tarsi yellow; gaster red.

Head (Figs 6, 7).- Wider than long in facial view, wider than thorax, with dense pubescence on fronto-genal angle, vertex with large hairs, lateral surface with dense woolen hairs; preorbital carinae faint near middle of face otherwise indistinct, post orbital carinae absent; fronto-clypeal suture incomplete; clypeus and post clypeus with shining smooth surface; scrobe cavity deeply excavated, shining, carinated on latero-ventral margin, carinae not continued below antennal sockets; eyes glabrous; occipital carinae short; ocelli in obtuse angled triangle, basal ocellus separated from eye rim by less than its diameter and from occipital margin by about thrice its diameter.

Antennae (Fig. 8).- Scape long exceeding front ocellus about five and one-half times as long as wide (0.56:0.10), as long as pedicel to 3rd funicle segment combined; pedicel longer than wide; annellus transverse; funicle segments 1-4 subequare, 5-7 wider than long; club about twice as long as wide (0.23: 0.12), slightly longer than preceding two funicle segments combined.

Thorax.- Densely pitted, interspaces of pits narrow and carinated, scutellum rounded at apex.

Forewings.- Hyaline, less than three times as long as wide (1.75:0.63); submarginal, marginal, post marginal and stigmal veins, 0.82, 0.3, 0.11 and 0.05 mm. in length respectively.

PLATE - II

Brachymeria (Metacurumeria) rufotibialis sp.n., ♀

(Figs. 6-10).

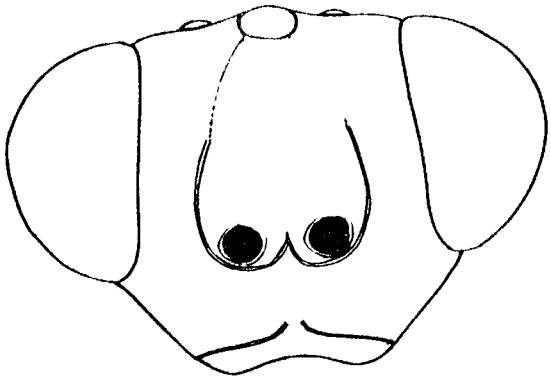
6. Head (Facial view)

7. Head (Lateral view)

8. Antenna

9. Hind leg

10. Gaster.



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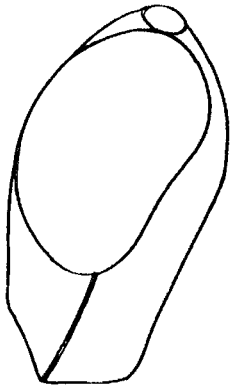

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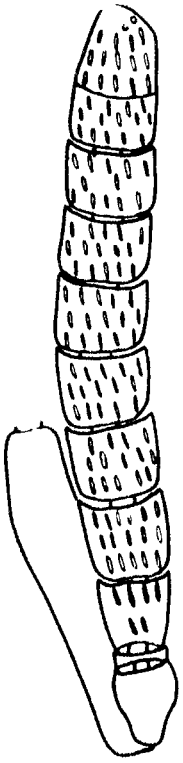

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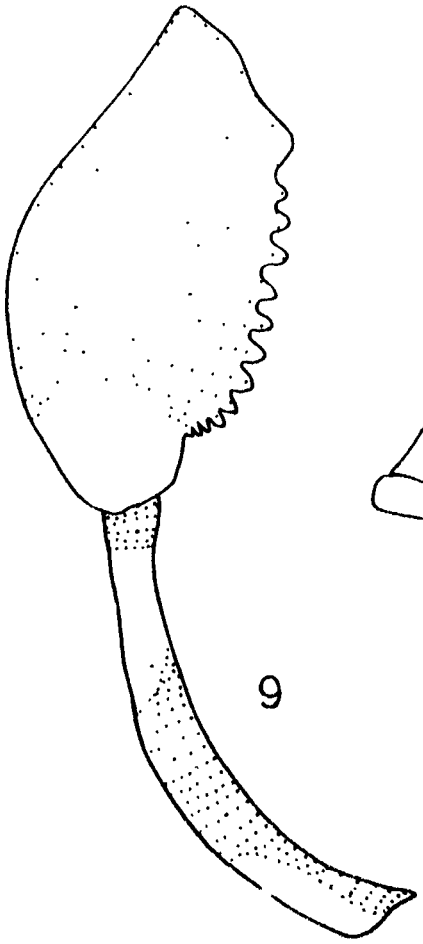

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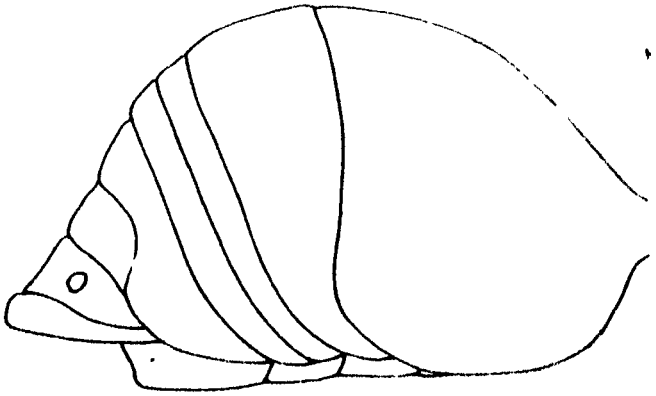

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Hind wings.- Hyaline, about three and a half times as long as wide.

Hind legs (Fig. 9).- Coxae and femora densely punctate on ventral surface with silvery white pubescence, outer- ventral margin of femora with 13 teeth, basal tooth robust.

Gaster (Fig. 10).- Subacuminate at apex, tergite I slightly less than one-half of gaster, densely punctate at apex on dorsal surface, tergite II densely punctate on dorsal surface, lateral surface densely setose, tergites 3-7 densely setose: apex of ovipositor with the last tergite as long as penultimate.

Female length .- 2.35 mm.

Holotype: ♀, India, Uttar Pradesh, Aligarh, ex. Sniloscma sp. on Ricinus communis L. 15.vii.1970 (Cat. No. 7-3).

Paratype: 1 ♀ (Data same as for holotype).

B.(Brachymeria) lasus (Walker)

(Figs. 11, 12, 25, 32 a & b, 39)

1841 Chalcis lasus Walker. Entomologist: 219

1874 Chalcis obscurata Walker. in Smith, Trans. Ent. Soc. London: 399-400.

1883 Chalcis sanlosse Kirby (nec. Westwood) (Partim). Journ. Linn. Soc. Lond., Zool. 17: 68.

1901 Chalcis obscurata Ashmead, Fauna Hawaii, I: 306.

1906 Chalcis Obscurata Banks, Phillipp. Journ. Sci. 1: 216.

1910 Chalcis obscurata Crawford, Tech. Ser. U.S. Deptt. Agr. Ent. no. 19, Pt. 2: 14, 17.

1932 Brachymeria obscurata Ishii, Icon. Ins. Jap. (Ist Edit.) : 346.

1939 Brachymeria obscurata Takano et Yanagihara, Taiwan, Kansho Gaiekichu Hen: 245.

1943 Brachymeria sanlosse Sonan (= Hinzukuma) (nec. Westwood) (Partim), Rep. Gov. Formosa, Agr. Exp. Stat. 84: 79.

1950 Brachymeria obscurata Ishii, Icon. Ins. Jap. (revised Edit.): 1405.

1957 Brachymeria obscurata Ishihara, Taxono-agronomie Ent. Jap.: 392.

1960 Brachymeria obscurata Habu, Bull. Natl. Inst. Agric.Sci. C.No. 11: 168.

1962 Brachymeria obscurata (Walker), Habu, Fauna Japonica: 33.

1973 Brachymeria lasus (Walker) Joseph et al., Dept. Zool., Univ. Calicut, India, monogr. No. I: 29, 31.

Female:

Head black, eyes and ocelli liver-red, antennae black; thorax black, tegulae yellow; fore and middle legs with coxae and two-third femora black, apical one-third of femora, tibiae and tarsi yellow; hind legs with coxae femora except apex black, base and ventral margin of tibiae black, apex of femora, rest of tibiae and tarsi yellow; gaster black; forewings with dark veins.

Head (Figs. 11, 12).- Wider than long in facial view, wider than thorax, shallowly pitted on vertex and occipital region, frons microsculptured and with dense silvery white pubescence; post-clypeus unpitted and with few hairs; eyes glabrous, pre orbital carinae absent, post orbital carinae distinct; scrobe cavity smooth, shining, reaching to front-ocellus, carinated on ventral half, ocelli in obtuse angled triangle, basal ocellus removed from eye rim by less than its diameter, and from occipital margin by about three times its diameter, occipital carinae short right mandible with two blunt teeth.

Antennae (Fig. 25).- Scape long extending to front-ocellus, less than four times as long as wide (0.62:0.16), shorter than pedicel to 3rd funicle segment combined; pedicel nearly subequare; annellus transverse; funicle segments 1-2 longer than wide, segments 3-4 subequare, 5-7 wider than long; club truncated at apex, less than two times as long as wide (0.33:0.21), as long as preceeding two funicle segments combined.

Thorax .- Compactly pitted, interspaces of pits carinated, with silvery white pubescence; scutellum rounded at apex.

Fore wings .- Hyaline, less than three times as long as wide (2.75 : 1.1); submarginal, marginal, postmarginal and stigmal veins 1.1 : 0.61 : 0.2 : 0.07 mm. long respectively.

Hind wings .- Hyaline, nearly three and a half times as long as wide.

Hind legs (Fig. 32 a & b).- Hind coxae with a tooth on ventral surface, dorsal surface smooth, ventral surface of coxae and femora densely punctate with dense silvery white pubescence, outer ventral margin of femora with 12 teeth.

Gaster (Fig. 39).- Sub acuminate at apex, tergite I more than half as long as gaster, smooth on dorsal surface, tergite II densely punctate at apex, on dorsal surface, lateral surface densely setose, tergite VI densely setose, as long as tergite VII with the apex of ovipositor combined; ovipositor concealed.

Female length .- 3.75 mm.

Holotype: ♀. India, Uttar Pradesh, Aligarh, ex. Spodoptera litura on Ricinus communis L., 2.xii.1978, (Cat.No. 7-5).

Paratype: 1 ♀ (Data same as for holotype).

Brachymeria (Brachymeria) sp.nr. gastropachae sp.n.
(Figs. 13, 14, 26, 33 a & b, 40, 46, 47)

Female:

Head black, eyes and ocelli pinkish, antennae with scape and pedicel liver red, rest part of antennae black; thorax black, tegulae yellow; fore and middle legs with coxae, trochanter and basal two-third femora dark, apical one-third of femora, tibiae and tarsi yellow, hind legs with coxae and femora except apex black, base of tibiae reddish, apex of

femora, tibiae except base and tarsi yelow; gaster reddish.

Head (Figs. 13, 14).- wider than long in facial view, wider than thorax, densely pitted with silvery white pubescence, interspace of pits carinate, post clypeus with shining unpitted space; pre-orbital carinae absent; post orbital carinae distinct; scrobe cavity deeply excavated, shining, with carinate margins on ventral half; surface above geno-frontal carinae densely setose; eyes bare; occipital carinae short; ocelli in obtuse angled triangle, basal ocellus separated from eye rim by about its own diameter, and from occipital margin by thrice its diameter.

Antennae (Fig. 26).- Scape short, not reaching front-ocellus, about four and one-half times as long as wide (0.48 : 0.11), slightly more than pedicel to 3rd funicle segment combined; pedicel as long as wide; annellus transverse; funicle segments 1-3 as long as wide, segments 4-7 wider than long; club rounded at apex, less than thice as long as wide (0.24: 0.14), longer than preceeding two funicle segments combined.

Thorax.- Densely pitted, pits compactly arranged with silvery white pubescence, interspaces very narrow, somewhat carinated on scutum; scutellum rounded at apex.

Fore wings .- Hyaline, less than three times as long as wide (1.95 : 0.75), sub marginal, marginal, post marginal and stigmal veins 0.75, 0.4, 0.2, and 0.07 mm. long respectively.

Hind wings .- Hyaline near three and one-half times as long as wide.

Hind legs (Fig. 33 a & b).- Coxae with a blunt tooth on ventral surface, dorsal surface with silvery white pubescence; femora microsculpturedd, with silvery white pubescence, outer-ventral margin with 10 teeth, basal tooth robust.

Gaster (Fig. 40).- Subacuminate at apex, tergite I glabrous on dorsal surface, impunctate, less than one-half length of gaster; tergite II densely setose on lateral surface, last tergite with the apex of ovipositor slightly longer than penultimate; subgenital plate (Fig. 46) with lateral horns on anterior margin, posterior margin with a notch in the middle; ovipositor (Fig. 47) concealed, outerplates of ovipositor broad in the middle, narrow and truncated at base, somewhat rounded at apex, with a thick muscular ridge along ventral margin, dorsal margin with a thin muscular ridge; first valvifer with apical and basal angles at the same level, second valvifer narrow subbasally, third valvulae lanceolate, about one-fourth of second valvifer and movably articulated.

Female length.- 2.78 mm.

Holotype: ♀, India, Uttar Pradesh, Pant Nagar, ex. Pieris brassicae L., on Brassica oleracea L., 8.xi.1977, (Cat. No. Br.I).

Paratype: 1 ♀ (Data same as for holotype).

Brachymeria (Brachymeria) flavotibialis sp.n.

(Figs. 15, 16, 27, 34, 41)

Female:

Black, except tegulae, apical half of fore and mid femora, apex of hind femora, fore and mid tibiae and tarsi, hind tibiae except base and ventral margin and tarsi orange yellow.

Head (Figs. 15, 16).- Wider than long in facial view, wider than thorax, densely punctate with silvery white pubescence except a median smooth post-clypeus, lateral surface with wooly hairs; pre-orbital carinae absent; post orbital carinae distinct; eyes glabrous; scrobe cavity extended to front ocellus; occipital carinae short; ocelli in obtuse angled triangle, basal ocellus removed from eye rim by less than its diameter, and from occipital margin by three times of its diameter.

Antennae (Fig. 27).- Scape four times as long as wide (0.50 : 0.125), as long as pedicel to 3rd funicle segment combined; pedicel as long as wide; annellus transverse; funicle segments 1-2 as long as wide, segments 3-7 wider than long; club twice longer than wide (0.32 : 0.16), longer than preceding three funicle segments combined, rounded at apex.

Thorax.- Densely pitted, interspaces of pits very narrow and carinate, shagreened with silvery white pubescence; scutellum rounded at apex.

Fore wings .- Hyaline, two and one-half times as long as wide (1.9 : 0.75); sub marginal, marginal, post marginal and stigmal veins, 0.79; 0.38; 0.14 and 0.08 mm. in length respectively.

Hind wings.- Hyaline, about three and a half times as long as wide.

Hind legs (Fig. 34).- Coxae densely punctate on ventral surface with silvery white pubescence, femora covered with wooly hairs, outer-ventral margin with 10 teeth, basal tooth robust.

Gaster (Fig. 41).- Accuminate at apex, slightly longer than thorax, tergite I almost glabrous, extending to one-third

length of gaster, tergite II densely punctate on sublateral surface, III- V with two rows of setae, VI densely setose, apex of third valvulae with last tergite shorter than penultimate; subgenital plate densely punctate with a notch on posterior margin.

Female length .- 2.61 mm.

Holotype : ♀, India, Uttar Pradesh, Pilibhit, ex. Hyaleusia sp. on Oryza sativa L., 2.x.1977. (Cat. No. 7-15).

Brachymeria (Brachymeria) nigricornoria sp.n.

(Figs. 17, 18, 28, 35, 42)

Female:

Head black, eyes and ocelli reddish brown; antennae black, thorax black, tegulae yellow; fore and middle coxae, basal half of femora black, inner margin in the centre of tibiae reddish, apex of femora, rest of tibiae and tarsi yellow, hind legs with coxae black except apex being red, femora red except yellow at apex, tibiae red at base and in the middle, subbasal and apical part of tibiae and tarsi yellow; gaster black.

Head (Figs. 17, 18).- Wider than long in facial view, wider than thorax, densely pitted, paranscrobal area sparsely pubescent ventral area near fronto-genal angle and lateral surface of head with dense woolen hairs, vertex with comparatively larger hairs; clypeus with few pits, post clypeus with smooth area; pre and post orbital carinae indistinct; eyes glabrous; scrobe cavity deeply excavated, limited by carinae on ventral half, exceeding to front-ocellus; occipital carinae very short; ocelli in obtuse angled triangle, basal ocellus separated from eye rim by less than its diameter, and from occipital margin by three times of its diameter.

Antennae (Fig. 28).- Scape not exceeding to front-ocellus, less than five times as long as wide (0.48: 0.1), as long as pedicel to 3rd funicle segment combined; pedicel distinctly longer than wide; annellus transverse; funicle segments transverse, club about one and one-half times as long as wide (0.22 : 0.14), longer than preceeding two funicle segments combined.

Thorax.- Densely pitted, interspaces of pits very narrow, less than the diameter of pits; shagreened with silvery white hairs; scutellum rounded at apex.

Fore wings.- Hyaline, about two and a half times as long as wide (1.45 : 0.6), sub marginal, marginal, post marginal and stigmal veins, 0.68, 0.32, 0.15 and 0.07 mm. long respectively.

Hind legs (Fig. 35).- Coxae densely punctate on ventral surface with silvery white pubescence, femora finely sculptured with wooly hairs, outer ventral margin with 13 teeth, basal tooth robust, second basal tooth shortest.

Gaster (Fig. 42).- Accuminate at apex, longer than thorax; tergite I almost glabrous densely punctate on apical half of adorsal surface, tergite II densely punctate on dorsal surface, lateral surface with dense setae, tergites III-VII densely setose; apex of third valvulae with last tergite slightly shorter than penultimate.

Female length.- 2.19 mm.

Holotype: ♀, India, Uttar Pradesh, Lakhimpur, ex. Parnara mathias Fabr. on Oryza sativa L. 7.x.1977 (Cat. No. 7-4).

Brachymeria (Brachymeria) commetrica sp.n.

(Figs. 19-20, 29, 36, 43)

Female

Black except eyes, ocelli, tegulae, apex of femora and tibiae of fore and middle legs, apex and subbasal area of hind femora and tarsi orange yellow, base of hind femora reddish.

Head (Figs. 19-20).- Wider than long in facial view, densely punctate, with silvery white pubescence, except a small smooth area in the middle of post-clypeus; pre and post orbital carinae absent; scrobe cavity exceeding to front-ocellus, eyes glabrous; occipital carinae short; ocelli in obtuse angled triangle, basal ocellus removed from eye rim by less than its diameter, from occipital margin by about thrice of its diameter; right mandible tridentate, left bidentate.

Antennae (Fig. 29).- Scape short, not exceeding to front-ocellus, about five times as long as wide (0.38 : 0.08) as long as pedicel to 3rd funicle segment combined; pedicel as long as wide; annellus transverse; first funicle segment as long as wide, 2-7 wider than long; club less than twice as long as wide (0.23 : 0.13) as long as preceeding two and a half funicle segments combined.

Thorax.- Densely pitted except a small unpitted area on anterior margin of pronotum; interspaces of pits narrow, apex of scutellum rounded, shagreened with silvery white pubescence.

Fore wings.- Hyaline, less than three times as long as wide (2.05 : 0.79), sub marginal, marginal, post marginal and stigmal veins 0.8; 0.41; 0.17 and 0.08 mm. long respectively.

Hind legs (Fig. 36).- Coxae with smooth dorsal surface, ventral surface densely punctate with silvery white pubescence; femora covered with silken hairs, outer-ventral margin of femora with 10 teeth, second basal tooth short.

Gaster (Fig. 43).- Accuminate at apex, as long as thorax excluding the exserted part of genitalia; tergite I about one-third of gaster, almost glabrous , tergite II punctate on dorsal surface, tergite III-VII with few setae, ovipositor exserted.

Female length .- 2.45 mm.

Holotype: ♀, India, Uttar Pradesh, Pilibhit, ex. Sniloxoma sp., on Brassica campestris L., 4.x.1977 (Cat. No. Br - 5).

Paratypes: 2 ♀♀ (Data same as for holotype)

Brachymeria (Brachymeria) josephi sp.n.

(Figs. 21-22, 30, 37, 44)

Female:

Black except tegulae, basal half of fore femora, basal one-third of mid femora, apex of hind femora, tibiae of fore and middle legs, hind tibiae except base and ventral margin and tarsi orange yellow.

Head (Figs. 21-22).- wider than long in facial view, wider than thorax, densely punctate with silvery white pubescence; post-clypeus with a smooth median area, clypeus punctate with few hairs; pre and post orbital carinae absent; eyes glabrous; scrobe cavity reaching the front-ocellus; occipital carinae short; ocelli in obtuse angled triangle, basal ocellus separated from eye rim by less than its own diameter and from occipital margin by three times its diameter.

Antennae (Fig. 30).- Scape not exceeding to front-ocellus, four and one-half times as long as wide (0.56 : 0.12), shorter than pedicel to 3rd funicle segment combined; pedicel slightly longer than wide; annellus transverse; funicle segments 1-3 as long as wide; 4-7 wider than long; club less than twice as long as wide (0.32 : 0.17), longer than preceeding two funicle segments combined.

Thorax.- Densely pitted with silvery white pubescence, pits with very narrow interspaces; scutellum rounded at apex.

Fore wings.- Hyaline, about three times as long as wide (2.3 : 0.76) submarginal, marginal, postmarginal and stigmal veins 1.15:0.37: 0.16: and 0.08 mm. long respectively.

Hind legs (Fig. 37).- Coxae smooth on dorsal surface, ventral surface densely punctate with silvery white pubescence; femora on dorsal and ventral surfaces with woolen hairs, femora on outer-ventral margin with 11 teeth, second basal tooth short.

Gaster (Fig. 44).- Strongly accuminate at apex, longer than thorax, tergite I covers about one-third of gaster, densely microsculptured on dorsal surface, lateral surface almost glabrous with only few setae, tergite II densely microsculptured on dorsal surface, lateral surface densely setose, tergites III-VI densely setose, ovipositor slightly exserted: apex of third valvulae with the last tergite longer than penultimate.

Female length: 3.1 mm.

Holotype ♀. India, Uttar Pradesh, Pilibhit, 4.x.1977. (Cat. No. Z - 1).

Host: Unknown.

Brachymeria (Brachymeria) hydrabadiensis sp.n.

(Figs. 23-24, 31, 38, 45)

Female:

Black except tegulae yellow, coxae dark brown, femora red except yellow at apex, fore and mid tibiae and tarsi orange yellow, hind tibiae red, black on ventral margin, tarsi yellow, gaster slightly red on ventral surface.

Head (Figs. 23, 24).- With dense silvery white pubescence, post-clypeus without smooth area; pre and post orbital carinae absent; occipital carina short; eyes glabrous; scrobe cavity slightly away from front ocellus; ocelli in obtuse angled triangle, basal ocellus separated from eye rim by less than its diameter and from occipital margin by about three times its diameter.

Antennae (Fig. 31).- Scape not reaching front-ocellus, about four times as long as wide (0.48 : 0.12), as long as pedicel to 2nd funicle segment combined; pedicel as long as wide; annellus transverse; first funicle as long as wide, segments 2-7 wider than long; club longer than wide (0.26 : 0.2), as long as preceeding two funicle segments combined.

Thorax.- Densely punctate, puncts widely spaced on scutellum with interspaces more than their diameter; scutellum rounded at apex; shagreened with silvery white hairs.

Fore wings.- Hyaline, about two and a half times as long as wide (2.19 : 0.89); sub marginal, marginal, post marginal and stigmal veins 1.0; 0.4; 0.14 and 0.08 mm. long respectively.

Hind legs (Fig. 38).- Coxae smooth on dorsal surface, ventral surface densely punctate with silvery white pubescence, femora covered with wooly hairs, outer-ventral margin with 12 teeth, basal tooth robust, second basal tooth short.

Gaster (Fig. 45).- Accuminate at apex, as long as thorax, tergite I about one-half of gaster, densely punctate on dorsal surface, lateral surface with few setae; tergite II punctate on dorsal surface, lateral surface densely setose, tergite III-IVII densely setose.

Female length: 3.35 mm

Holotype: ♀, India, Andhra Pradesh, Hydrabad, 15.iii. 1976. (Cat. No. Br- 50).

Host: Unknown.


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PLATE - III

(Figs. 11-24).

11. Brachyneria (Brachyneria) lasus (Walk.) : Head (Facial view), ♀

12. B. (B.) lasus (Walk.) : Head (Lateral view), ♀

13. B. (B.) ruforcateri sp.n. : Head (Facial view), ♀

14. B. (B.) ruforcateri sp.n. : Head (Lateral view), ♀

15. B. (B.) flavotibialis sp.n. : Head (Facial view), ♀

16. B. (B.) flavotibialis sp.n. : Head (Lateral view), ♀

17. B. (B.) nigricorneis sp.n. : Head (Facial view), ♀

18. B. (B.) nigricorneis sp.n. : Head (Lateral view), ♀

19. B. (B.) [illegible] sp.n. : Head (Facial view), ♀

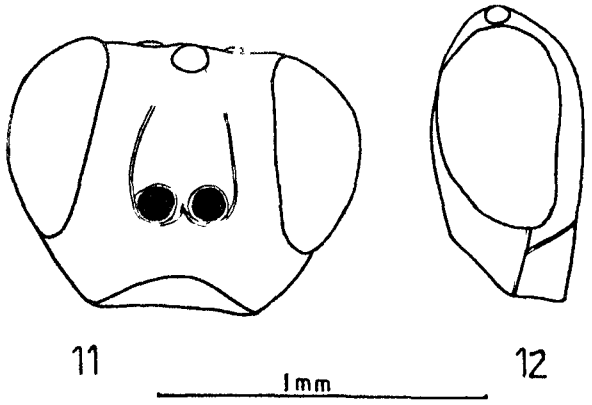
20. B. (B.) compactris sp.n. : Head (Lateral view), ♀

21. B. (B.) josephii sp.n. : Head (Facial view), ♀

22. B. (B.) josephii sp.n. : Head (Lateral view), ♀

23. B. (B.) hydrabadiensis sp.n.: (Facial view), ♀

24. B. (B.) hydrabadiensis sp.n.: (Lateral view), ♀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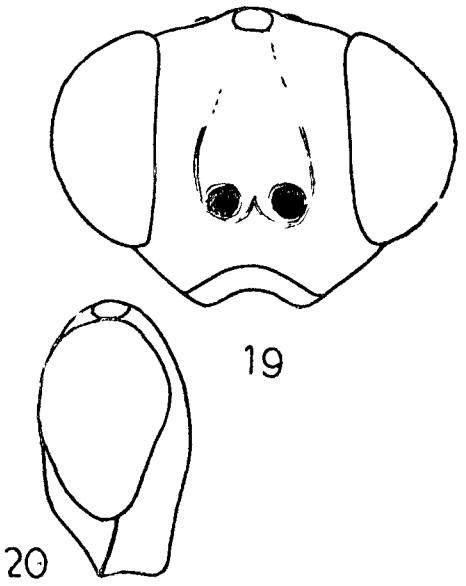
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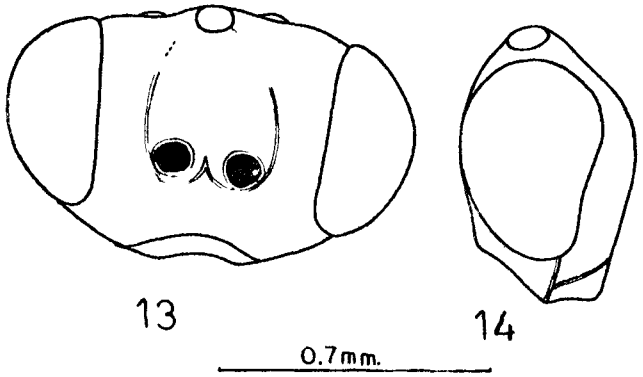
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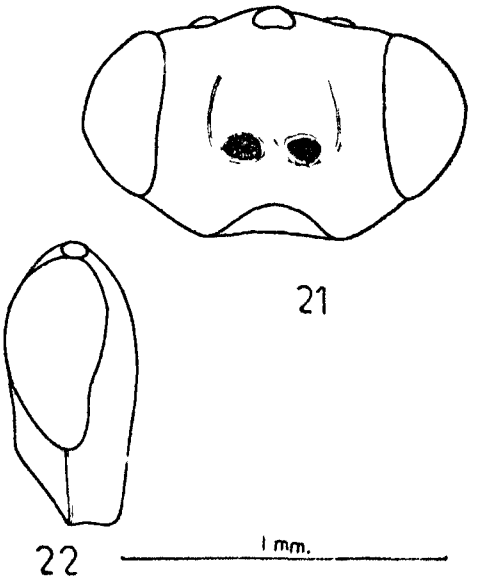
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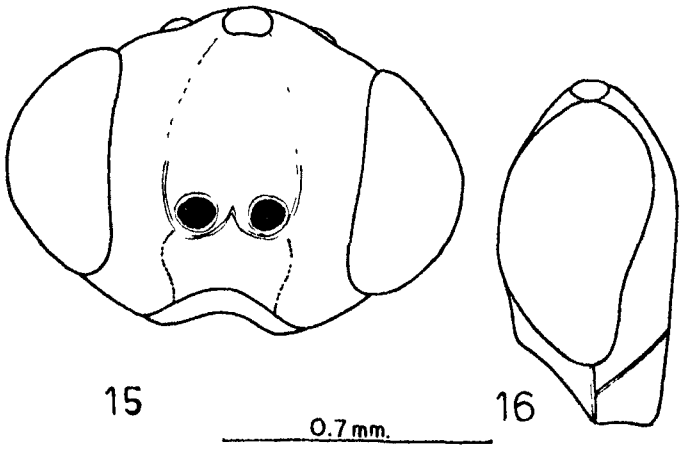
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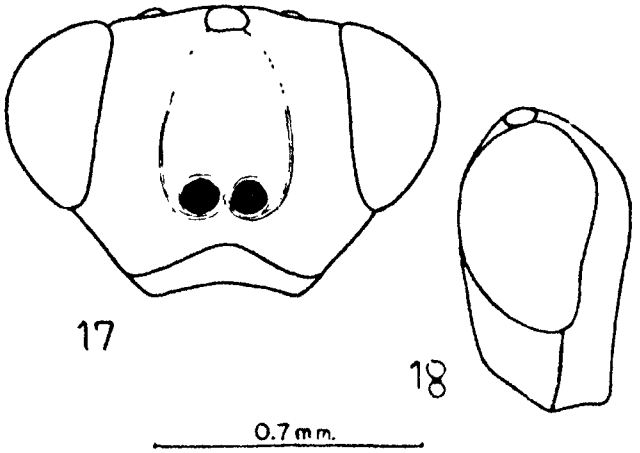
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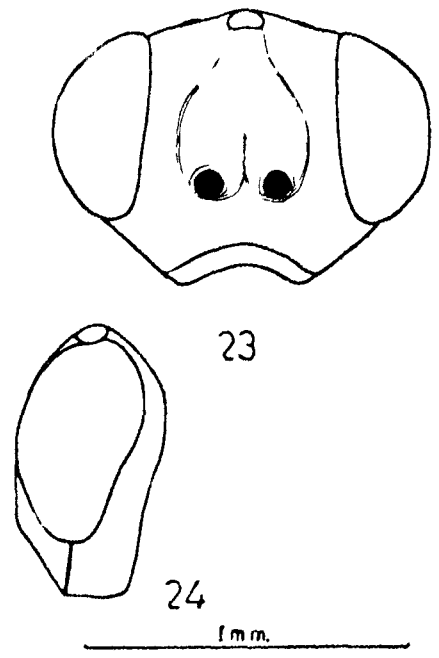

23
24
1mm.

PLATE - IV

(Figs. 25 - 31).

25. B. (B.) lusus (Walk.) : Antenna ♀

26. B. (B.) rufoscutori sp.n. : Antenna ♀

27. B. (B.) flavotibialis sp.n. : Antenna ♀

28. B. (B.) nigrioxyoris sp.n. : Antenna ♀

29. B. (B.) connectrix sp.n. : Antenna ♀

30. B. (B.) josephi sp.n. : Antenna ♀

31. B. (B.) hydrabadiensis sp.n. : Antenna ♀

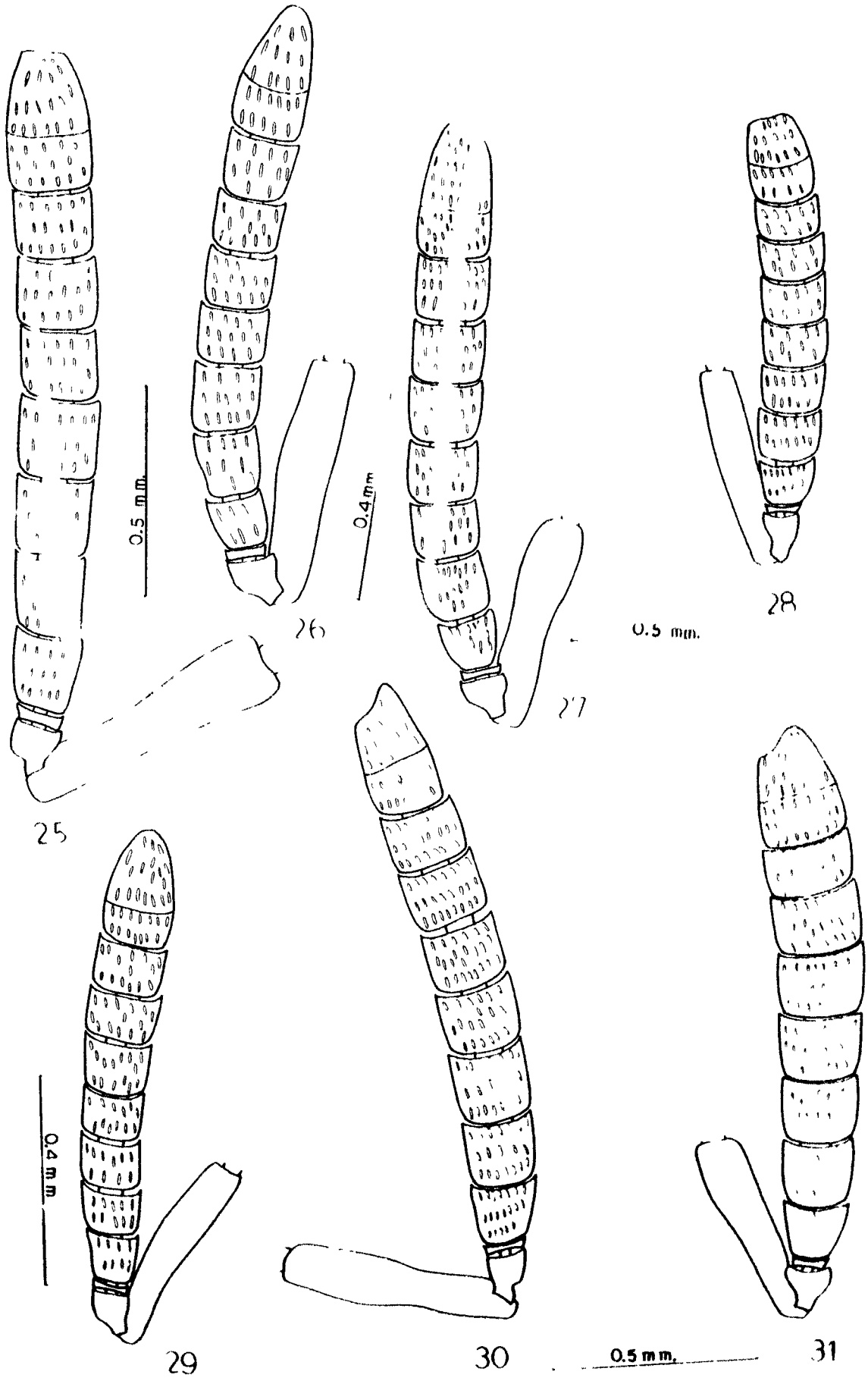

0.5 mm.
0.4 mm
0.5 mm.
0.4 mm
0.5 mm.
25
26
27
28
29
30
31

PLATE - V

(Figs. 32 - 38)

32a. *P.* (*P.*) *lasma* (Walk.) : Hind leg, ♀

32b. *P.* (*P.*) *lasma* (Walk.) : Hind coxa, ♀

33a. *P.* (*P.*) *rufomeateri* sp.n. : Hind coxa, ♀

33b. *P.* (*P.*) *rufomeateri* sp.n. : Hind leg, ♀

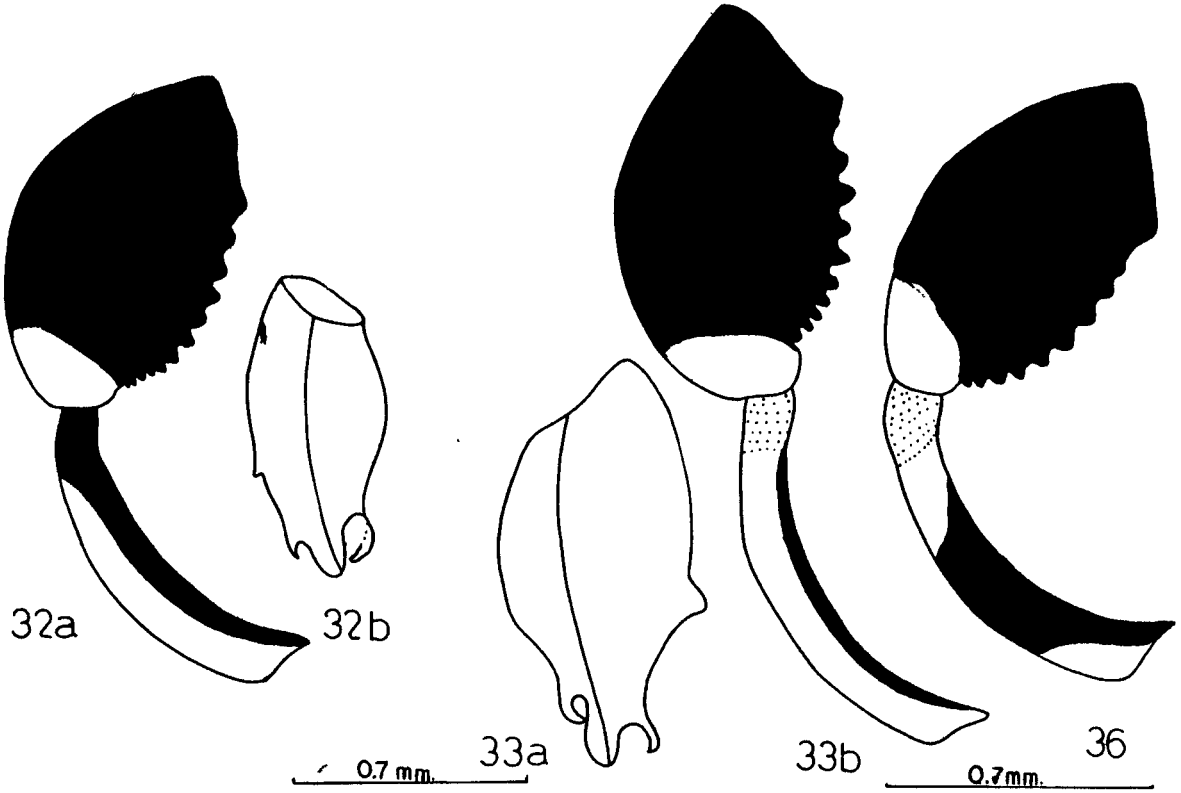
34. *P.* (*P.*) *flavotibialis* sp.n. : Hind legs, ♀

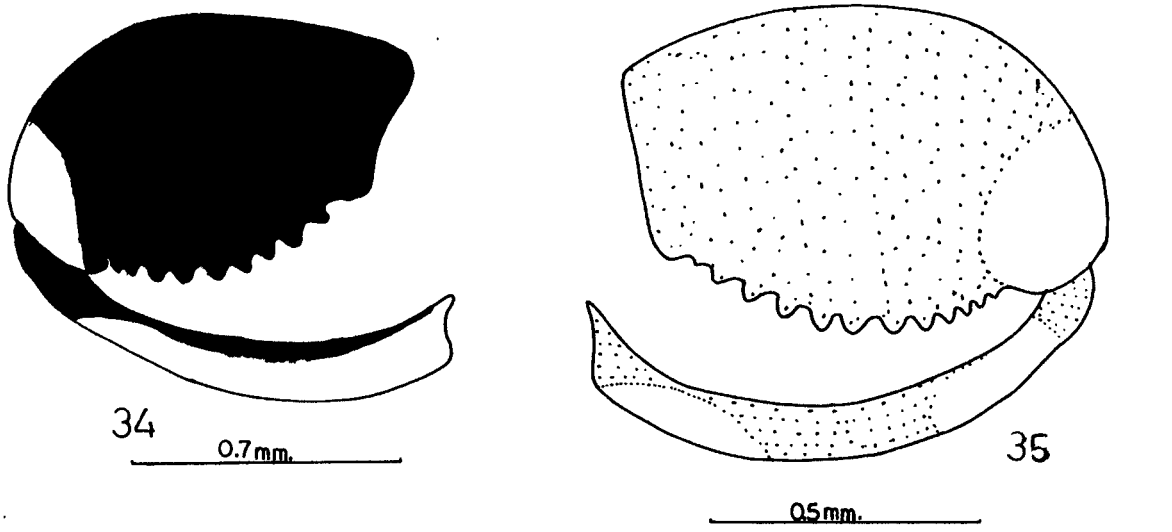
35. *P.* (*P.*) *nigricoxoria* sp.n. : Hind coxa, ♀

36. *P.* (*P.*) *communis* sp.n. : Hind leg, ♀

37. *P.* (*P.*) *josephi* sp.n. : Hind leg, ♀

38. *P.* (*P.*) *hydrabadiensis* sp.n. : Hind leg, ♀


32a
32b
0.7 mm.
33a
33b
36
0.7mm.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35
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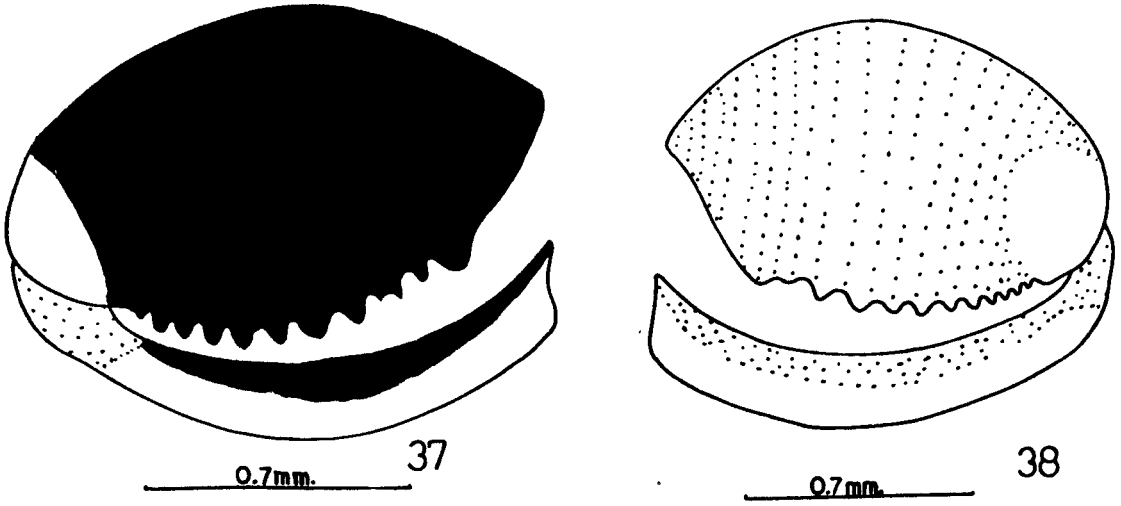

0.7mm.
37
0.7mm.
38

PLATE - VI

(Figs. 39 - 47)

39. H. (H.) lasia (Walk.) : Gaster, ♀

40. H. (H.) rufoaeneri sp.n. : Gaster, ♀

41. H. (H.) flavotibialis sp.n. : Gaster, ♀

42. H. (H.) microcorpora sp.n. : Gaster, ♀

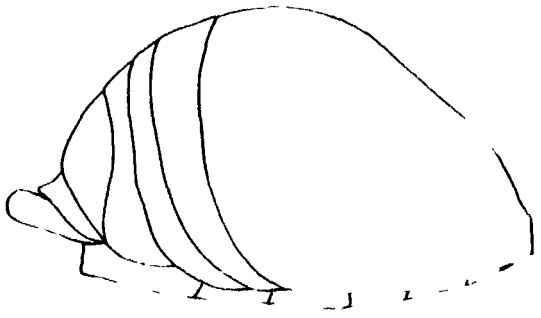
43. H. (H.) nemoatra sp.n. : Gaster, ♀

44. H. (H.) josephi sp.n. : Gaster, ♀

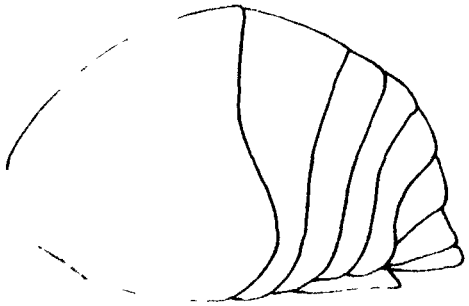
45. H. (H.) hydrabadensis sp.n. : Gaster, ♀

46. H. (H.) rufoaeneri sp.n. : Subgenital plate

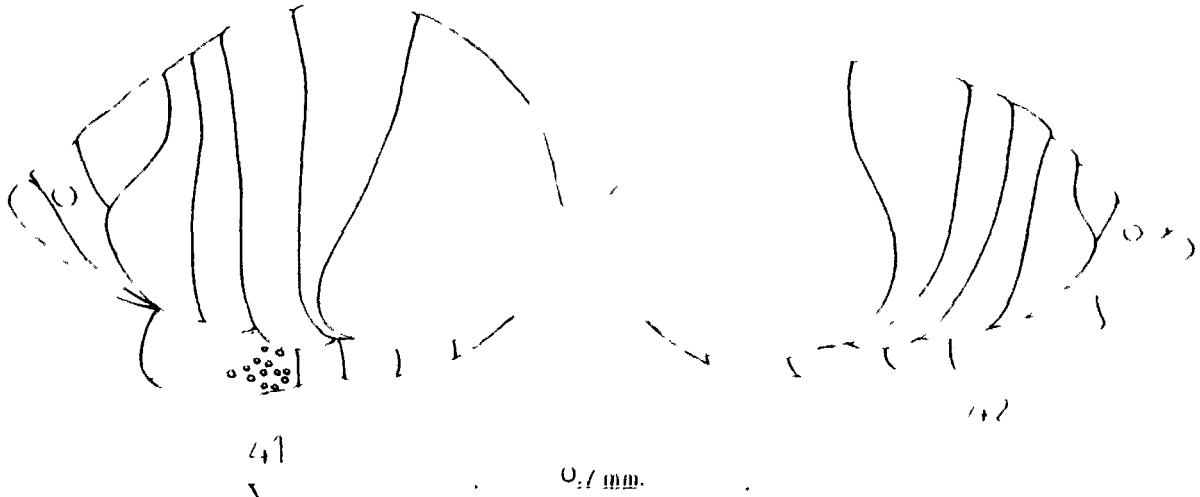
47. H. (H.) rufoaeneri sp.n. : Ovipositor.



0.1 mm. 39

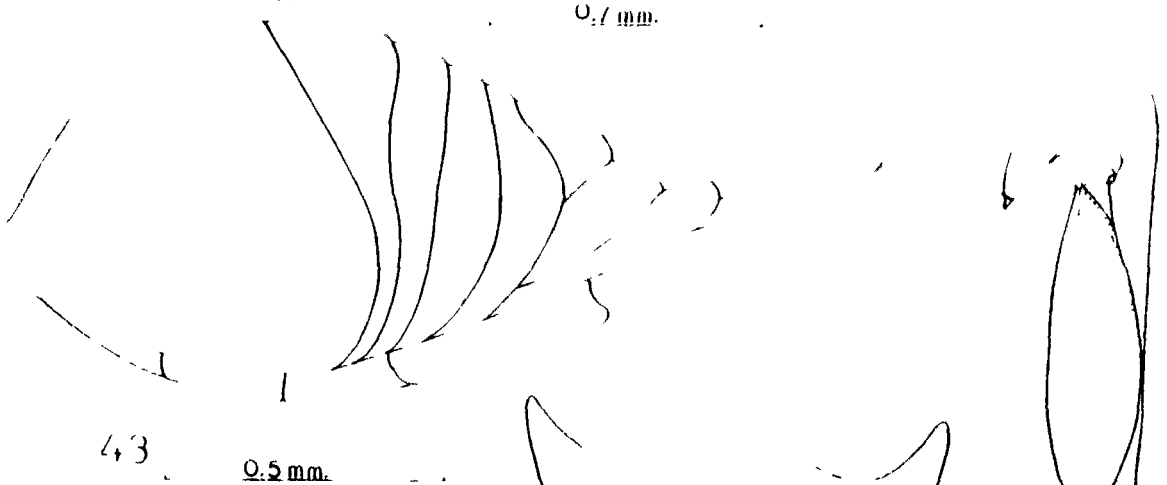


0.7 mm. 40



41 42

0.1 mm.



43

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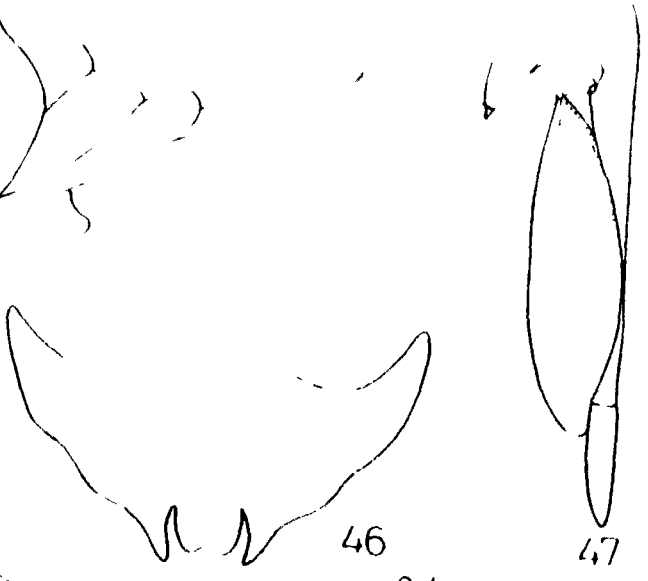
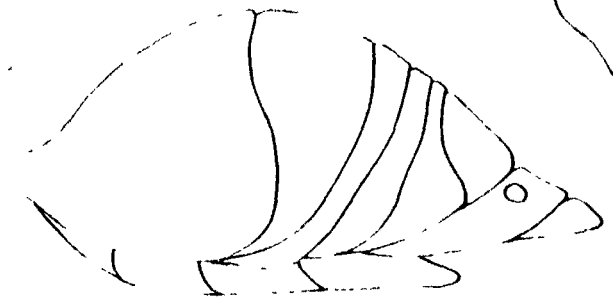


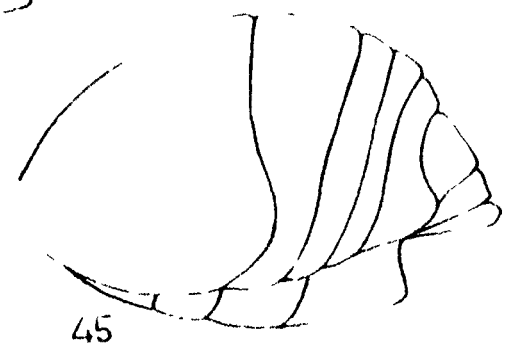
46 47

0.1 mm.



44

1 mm



45

Subfamily Halticheilinae

Antennae inserted below imaginary line connecting ventral margin of compound eyes, more or less near clypeus; head without horns, hind femora with pectinate, dense small teeth on outer ventral margin; hind tibiae truncated at apex with two distinct spurs and 3 carinae; petiole very short.

Subfamily Halticheilinae is divided into two tribes.

Key to the tribes of subfamily Halticheilinae

1. In fore wings marginal vein adjoining anterior wing margin, generally postmarginal and stigmal veins well developed.....Halticheilini

-- In fore wings marginal vein not adjoining anterior wing margins but a little remote from it; post marginal absent, stigmal very short.....Hybothoracini

Tribe Halticheilini

Marginal vein of fore wings adjoining anterior wing margin; post marginal vein usually more or less developed;

ventral teeth (and also lobes) of hind femora projecting on outerside of hind tibiae when they are bent.

Masi (1929) described 6 new genera: Stenochalcis, Tainania, Tainaniella, Sabatius, Sabatiella and Malamburnia Along with Hockeria Walker in his study of 'Oriental Chalcididae'. He also added 13 new species. Steffan (1950) proposed a group 'Neochalcis' and combined Neochalcis Kerby. (=Orthochalcis Kieffer); Chimaera Latr.(= Hinnota Walk.) and Tanycormus Cameron (= Malamburnia Ms. = Sabatius Ms.). He also described 2 new species. In 1957 he proposed a new genus - Amachalcis.

Boucek (1951) described 7 genera and 24 species from the European region. Nikolskaya (1952) included 8 genera in addition to Anbaeganonbora which she described as new genus. Total number of species in her faunatic studies rose to 22 including 8 new ones.

Steffan (1957) made a comprehensive study of the genus Tanycormus Cameron from the Afro-Asian region. He described 15 species including 5 new species.

Nikolskaya (1960a) recorded 7 genera including a new genus Verrobia and 31 species. In (1960b) the number of genera and species from USSR rose to 12 and 46 respectively.

Habu (1960, 62) described Nipponhoreria Habu as a new genus. He also recorded 4 genera and 12 species included 9 new descriptions from Japan.

Peck (1963) in their catalogue of Nearctic fauna discuss 3 genera and 12 species. Peck et al. (1964) framed a key to 11 genera from Czechoslovakia. Farrogi (1976) successfully pointed out the possibility of distinguishing the genus Antrocephalus from other related genera on the basis of the male and female genitalia. Tryapitzin (1978) in "Hymenoptera of European part of USSR" included 6 genera and 15 species (based on Nikolskaya, 1960). Burks (1979) in the Catalogue of Hymenoptera in America North of Mexico listed 3 genera and 9 species.

Key to genera of the Tribe Haltichellini included in the present work

1. Head of normal form; scutellum low.....2

— Head with vertex raised in the form of two short horns; scutellum exceptionally raised; tergite I without carinae.....Nacteinania gen. n.

2. Frons without pre orbital carinae along compound eyes...3

— Frons with distinct pre orbital carinae along compound eyes.....4

3. Tergite I without longitudinal carinae at basal area; frons seen from lateral side generally (except H. yoshiokai Habu) concave above antennal sockets.....Hockeria Walker

— Tergite I with some longitidunal carinae at basal area; frons seen from lateral side not concave.....Ninnohockeria Habu

4. Pre orbital carinae reaching fronto-genal sutures below compound eyes.....Antmocenbalua Kirby

— Pre orbital carinae reaching antennal sclerites.....Tainania Masi

A new genus Nacteinania and nine new species have been described in this tribe.

Nantainemia gen.n.

The proposed new species clearly stands out from other allied genera for its unusually raised scutellum, with a longitudinal carina in the middle, bilobed at apex; hind femora with two distinct lobes, basal lobe distinctly raised, outer ventral margin bearing a series of comb like teeth extending for more than two-third length of margin; basal five abdominal tergites glabrous, 6th with a single row of thick setae and 7th densely setose.

From Tainana Nasi it differs for its deep scrobal cavity; ocellar area raised into two short horns; pre-orbital carinae indistinct between basal ocelli; antennal sockets placed below the ventral margin of eyes but far remote from clypeus.

From Mirhinus it can be distinguished on the basis of short elevation on the head (Fig. 49).

It is therefore decided to erect a new genus Nantainemia for the proposed new species brevicornis.

Female (Fig. 48):

Head densely pitted with silvery white pubescence; ocellar area raised into two short horns (Fig. 49) scrobe

PLATE - VII

Fig. 48: *Nectairania brevicornis* sp.n. : ♀

Fig. 1

cavity deeply excavated, pre-orbital carinae distinct, interrupted in between basal ocelli; antennal sockets remote from fronto-clypeal suture; frons in lateral aspect slightly concave above antennal sockets; antennae short, scape reaching front ocellus, club 2-segmented; pronotum with well developed lateral carinae, posterior margin without setae; scutellum unusually raised with a distinct longitudinal carina in the middle, bilobed at apex (Fig. 53) forewings smoky, a hyaline patch just below marginal vein; post marginal as long as marginal, hind coxae and femora densely pubescent, outer-ventral margin of femora distinctly bilobed, basal lobe distinctly raised, bearing a series of comb like-teeth extending over more than two-third length of margin; basal 5 abdominal tergites almost glabrous, 6th bearing a row of thick setae, 7th densely setose, species are prasaites of lepidopteran larvae.

Female length 3.8 mm.

Genotype: Hentainia brevicornis sp.n.

Hentainania brevicornis sp.n.

(Figs. 48 - 54)

Female

Head (Fig. 49-51).- Distinctly wider than long in facial view (1.15 : 0.95), a little wider than thorax, distinctly

pitted, pits shallow, with narrow and carinate interspaces; scrobe cavity deep, rugose; ocellar area raised as two short horns; ocelli in obtuse angled triangle; eyes glabrous; preorbital carinae distinct, interrupted between basal ocelli; fronto-genal suture carinate, with silvery white pubescence.

Antennae (Fig. 52).- Black, scape less than seven times as long as wide (0.59 : 0.09), pedicel one and a half times as long as wide (0.14 : 0.09); annellus slightly wider than long; funicle segments 1-4 longer than wide, 5th as long as wide, 6-7 wider than long; club 2 segmented, twice as long as wide (0.31 : 0.15), longer than preceeding two funicle segments combined.

Thorax.- Black, moderately pitted on dorsal surface, interspaces of pits very narrow, mostly carinate, scutellum unusually raised with a distinct carina in the middle, distinctly bilobed at apex (Fig. 53); propodeum flat with a distinct, median areola (Fig. 54) and submedian carinae, lateral costae with a sharp tooth.

Fore wings.- Three times as long as wide (2.9 : 0.95), smoky except at apical one-third and basal one-third being hyaline, patch below stigmal vein with white setae; sub marginal six times as long as marginal vein (1.34 : 0.22), marginal and

PLATE - VIII

Nectaimania brevicornis spec. n. ♀

(Figs. 49 - 52)

49. Head (Facial view)

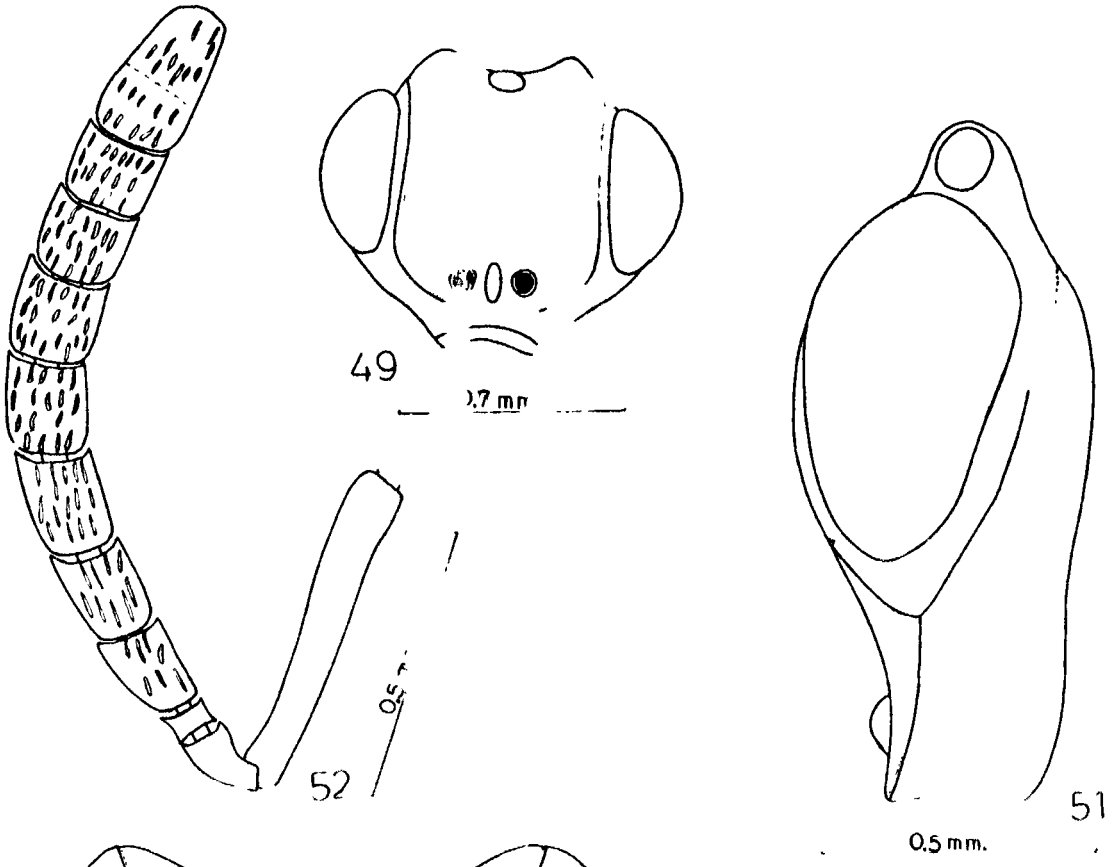
50. Head (Dorsal view)

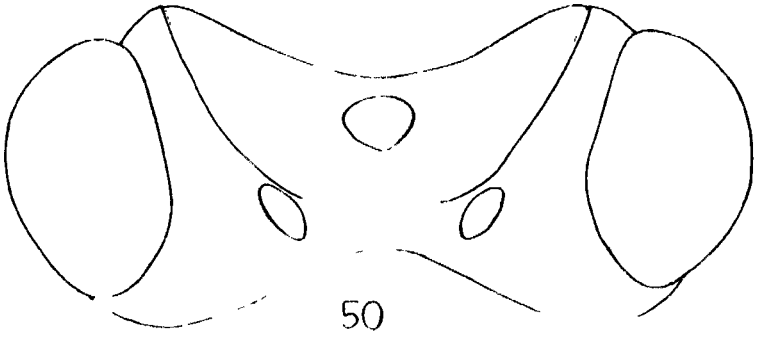
51. Head (Lateral view)

52. Antenna

53. Apex of scutellum

54. Propodeum.


49
0.7 mm
52
0.5 mm.
51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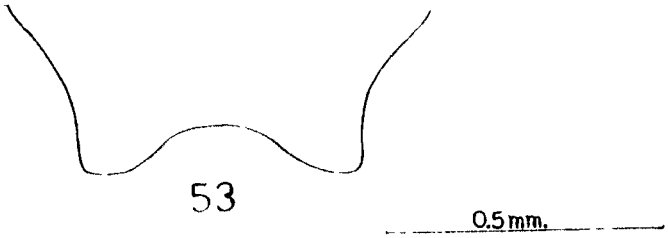
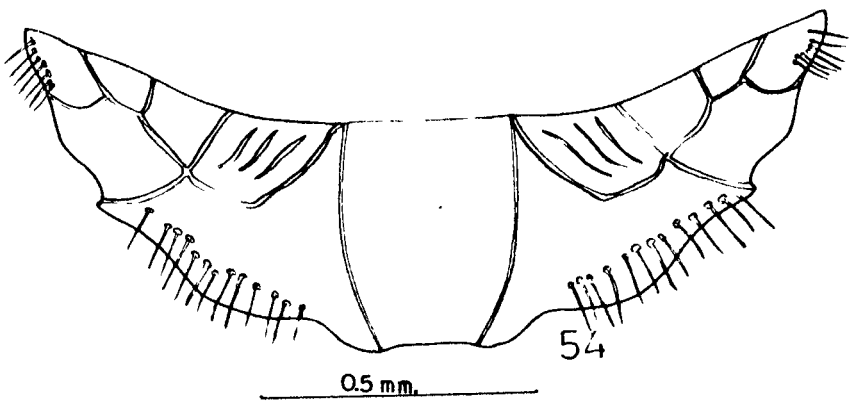

53
0.5 mm.


54
0.5 mm.

post marginal in the ratio of 3 : 1, post marginal as long as stigmal; marginal fringe short.

Hind wings.- Hyaline, three and a half times as long as wide; marginal fringe short.

Fore legs .- Black except bases and apices of femora and tibiae, tarsi orange yellow.

Middle legs .- Coloration same as on fore legs.

Hind legs .- Black except tarsi orange yellow; coxae and femora densely pubescent; femora on outer-ventral margin distinctly bilobed, basal lobe distinctly raised with a series of comb like teeth extending over more than two-third of the margin.

Gaster .- Black tergite I about two-third as long as gaster, without basal carinae and fovea; tergites 1-5 almost glabrous, 6th with a row of thick setae, 7th densely setose last abdominal tergite with the tip of ovipositor as long as penultimate; subgenital plate with a wide notch on the posterior margin in the middle; ovipositor concealed.

Female length: 3.8 mm.

Holotype: ♀, India, Uttar Pradesh, Aligarh, ex. *Aphidoxenus* sp., on *Brassica nomenstris* L., 10.xii.1978 (Cat. No. K - 35).

Genus Hockeria Walker, 1834.

Genotype: (Hockeria liminosa Walker, 1834, nec. Fabricius)
= Hockeria bifasciata Walker, 1834 (desig. by Kirby, 1883)

Walker, 1834: Ent. Mag. 2: 34 .- Kirby, 1883: Linn. Soc. Lond. Zool. 17: 54.- Sichel, 1865: Ann. Soc. Ent. Fr. 5: 348.- Dalla Torre, 1897: Catalogus Hymenopterorum V. Leipzig.- Keiffer, 1899: Ann. Soc. ent. Fr. 68: 366.- Masi 1916: Ann. Mus. Civ. Sta. Nat. Genova, 3,7(47): 54 .- Gahan et Fagan, 1923: Bull. U.S. Nat. Mus.: 124.- Masi, 1927: Bull. Soc. ent. Ital. 6: 208.- Masi, 1936: Bull. Soc. ent. Egypte, 20: 242.- Erdos, 1946: Fragm. Faun. Hung. 9: 49.- Kerrich & Menon, 1949: Ent. Month. Mag. 85: 207.- Steffan, 1949: Cah. Nat., n.s. 8: 8, 10-12 (Syn.).- Boucek, 1951: Acta Ent. Mus. Nat. Pragae, 27: 60.- Steffan, 1951: Bull. Mus. Nat. Hist. Nat. (Paris), 4: 375.- Nikolskaya: 1952: Opred. Faune USSR. 44: 98.- Steffan, 1955: Ann. Mus. Congo Tervuren, Zool. 40: 10.- Tachikawa et Takechi, 1958: Ins. Matsumurana, 22: 35 .- Nikolskaya, 1960(a): Akad. Nauk. SSSR, 27: 226.- Nikolskaya, 1960(b): Zool. Inst. Akad. Nayk, SSSR, VII: 126.- Habu, 1960: Bull. Nat. Inst. Agr. Sci. Ser. c.no. 11: 220.- Habu, 1962: Fauna Japonica: 71.- Peck, 1963: Cat. Nearct. Chalcid.: 848.- Peck. et al., 1964: Mem.Ent. Soc. Canad. no. 34: 15.- Boucek, 1972: Ent. Gazette, 23:

257.- Mani & Dubey, 1973: Mem. Sch., St. John's College, Agra, no. 3: 8.- Boucek, 1974: J. ent. Soc. Sth. Afr. 37(2): 231.- Nikolskaya, 1978: Opred. Faune CCCP, no. 120: 4[illegible].- Burks, 1979: Cat. Hym., Amer. N. Mexico, 1: 861-

Synonyms:

Hockeria Walker, 1834: Ent. Mag. 2: 21, 34.

Genotype: Chalcis bipunctata Fabr. (Design. by Kirby, 1883).

Chalcis Ponscolombe, 1840: Ann. Soc. Nat. Zool., Ser. 2, 13: 187.

Halticella Walker, 1871: Notes on Chalcidoidea, 3.

Haltichella Thomson, 1875: Scandinaviens Hymenoptera, IV: 19.

Stomatocera Kirby, 1883: Journ. Linn. Soc. Lond. Zool. 17: 54, 62.

Genotype: Haltichella liberator Walker (Orig. desig.)

Stomatocera Ashmead, 1894: Trans. Amer. Ent. Soc. 21: 322. (Erroneous subsequent spelling).

Centrochalcis Cameron, 1905: Zeitschr. Syst. Hym. Dipt. 5: 230.

(Genotype: Centrochalcis ectodentata Cameron (monobasic).

Chalcis Masi, 1908: Boll. Soc. Zool. Ital., 9: 3.

Hymochalcis Girault, 1915: Ent. News 26: 325.

Genotype: Chalcis n.denta Masi (Monobasic and orig.desig.)

Orthochalcis Silvestri, 1943: Boll. Lab. Zool. Gen. Agr.- agr., Portici: 32: 250.

Afrochalcis Schmitz, 1946: Inst. Par. Nat. Congo. Belge, Bruxelles: 192.

Stomatocerus Nikolskaya: 1952: Opred. Faune CCC , : 94.

Genus Hockeria Walker is very close to Euchalcis Dufour but differs from it for its dull hind femur, with fine sculpture, abdomen without conspicuous pubescence: antennae mostly short and frons less concave (Boucek, 1951). Owing to many intermediate forms Boucek (1951) has rightly felt the difficulty of placement of non-European species. There is every possibility of these genera being declared synonyms. But before it is done, an extensive study of the species is required. The present writer has described two new species vulgaris and nikolaeskayii and tentatively placed it under Hockeria Walker on the basis of it over all resemblance with the genus. The generic characters of Hockeria are enumerated in details below:

Head with shallow scrobe cavity: pre orbital carinae absent: compound eyes glabrous or sparsely ciliate in female rather densely setose in male: antennal sockets situated very

near to clypeus; frons in lateral aspect generally concave above antennal sockets; fronto-genal sutures present; right mandible tridentate, left bidentate; antennae long, scape generally reaching level of front ocellus in female and not in male, pedicel longer in female than in male, ring segment more or less longer in female, than in male, funicle not distinctly thickened, club short; pronotum without fringes on posterior margin; apex of scutellum forming two short, broad dents, sometimes dents are indistinct; costa lateralis forming almost two minute dents; areola radia distinct; wings with dark patches but in male patches are faint or absent; post marginal vein variable either absent or well developed; hind femora with distinct two lobes; tergite I smooth in female densely punctate in male, without carinae, though with small fovea at middle of basal area.

Largely the species of this genus are parasites of Microlepidopterous larvae, some have been observed to parasitise tsetse-flies, pupae of Steripeiptera and ant-lions (Neuroptera).

2 new species have been described and a key to species framed.

Key to species of the genus Hookeria Walker based on females:

1. Dents of the scutellum always much shorter, sometimes scarcely indicated, broad, labrum simply deepened; postmarginal vein usually shorter, wings often hyaline with brown spots or vice versa.....2

— Dents of scutellum as long as broad, labrum with distinct median keel shaped elevation; postmarginal vein very distinct, as long as marginal; wings smoky brown, without hyaline spot.....H. hookerioides (Boucek) .....(Neochalcis hookerioidea Boucek)

2. Largest dent of the posterior femora (apparently the only one) in the distal fifth; abdomen infront, basal part of antennae and legs yellowish red.....3

— Distal dent nerver the largest one on the hind femora, the proximal dent always atleast as large as the distal one.....4

3. Annelus transverse, dorsal part of the thorax closely punctured, interspaces transversely striolated, not longer than the punctures themselves; abdomen shorter than the thorax, posteriorly covered with sparse hairs

Which are twice shorter than to almost as long as the median keel of the epipygidium; wings at apex without white spots.....H. masii Boucek*
H. fuminennis (Wlk.)

— Annellus distinctly longer than wide; thorax sparsely punctured, shiny, interspaces broader than the punctures themselves; abdomen longer than the thorax, hairs posteriorly (except on the pygostyle) at least four times longer than the epipygidial keel; fore wings brownish with two rounded white spots, the first at the stigmal vein, the other at the apex of the wing.....
.....H. ainularia Boucek

4. Abdomen and antennae black.....5

— Abdomen, legs and basal part of antennae light or dark reddish brown; antennae relatively short, annellus more than twice as wide as long; post marginal vein a little shorter than the marginal vein, wings hyaline with two brownish stripes, with a white spot between them, apical portion hyaline. 2.8 mm. .....
.....H. mangenillarum (Silvestri)

---

*H. masii Boucek and H. fuminennis (Wlk.) run together on the basis of their characters and may turn out to be synonyms.

5. Legs variable.....6

— Legs black.....H. *oxlex* (Nik.)

6. At least hind femora and hind tibiae in the middle more or less black.....7

— Femora and some portions of hind legs reddish yellow....20

7. Abdomen as long as or longer than head and thorax combined; large species 4–6.5 mm. 8

— Abdomen shorter than head and thorax combined; species small 1.5 - 3.5 mm.....11

8. Tergite I one-half as long as gaster.....9

— Tergite I about one-third as long as gaster.....10

9. Posterior margin of second tergite straight..... .....H. *mudaureliae* Boucek

— Posterior margin of second tergite broadly emarginate.... .....H. *ornana* Boucek

10. Postmarginal as long as marginal vein; lobes on hind femora distinct; last abdominal tergite as long as penultimate.....H. *magna* Boucek

— Postmarginal one-third of marginal vein; lobes on

hind femora indistinct, last abdominal tergite about half of the penultimate.....H. nilgriensis Wani & Dubey

11. Post marginal distinctly shorter than marginal vein....12

-- Post marginal as long as marginal vein, distinct in all its length.....18

12. Brownish spot on the forewings sharply delimited, behind the stigmal veins are two transversely placed hyaline spots with a white pubescence, apical quarter of wing entirely hyaline.....13

-- Yellowish brown spot on the forewings unsharply delimited, also quarter of wing slightly smoky, behind the stigmal vein usually only one round hyaline spot.....15

13. Scutellum slightly emarginate at apex; tergite I about one-fourth of gaster.....14

-- Scutellum bilobed at apex; tergite I about one-half of gaster.....H. unicolor Boucek

14. Last abdominal tergite with the tip of ovipositor about half of penultimate; tergite II almost glabrous, impunctate; tergite I one and two-third as long as

gaster; tegulae, legs and abdomen reddish brown, remaining parts black.....H. nikolskayii sp.n.

-- Last abdominal tergite with the tip of ovipositor as long as penultimate; tergite II punctate and setose on dorsal surface; tergite I one and one-fourth as long as gaster; body almost black.....H. vulgaris sp.n.

15. Tergite I covers about one-half of gaster.....16

-- Tergite I covers one-fourth of gaster...H. yoshiokai Habu

16. Post marginal vein distinct.....17

-- Post marginal vein indistinct.....*H. nipponica Habu

17. Distal half of forewings entirely brownish yellow, smoky, only slightly lighter at the end; abdomen at least as broad as thorax, at most twice as long as wide, posteriorly abruptly narrowed, short pointed carina on the epipygidium shorter than the distance between the pygostyles; tegulae black.....
.....H. hofferi Boucek

---

* According to Habu (1960,'62) H. nipponica Habu is very close to H. bifasciata except for indistinct postmarginal vein and forewings of female with subapical patch shorter, almost as long as apical pale yellowish area as compared with his figure given by Boucek (1951, Fig. 90) and not dark along apical margin.

— Second dark strip on the fore wings on the outside unsharply delimited, nevertheless distinctly darker than the slightly smoky apical quarter; abdomen narrower, distinctly more than twice as long as wide, posteriorly conically narrowed in a straight line; epipygidial carina longer than the distance between the pygostyles; tegulae usually red; red coloration of the knees and of the ends of tibiae extensive..... ..... H. bifasciata Walker

18. Fore wings smoky.....19

— Fore wings hyaline except a faint spot just below marginal vein..... H. karaimana Wani and Dubey

19. Abdomen about one and a half times as long as wide, oval, ovipositor with epipygidium very short, keel of the epipygidium distinctly shorter than the distance between the pygostyles; antennae short, pedicel at least two and a half times as long as wide, last funicle segment as long as wide; both transverse spots of the fore wings dark..... H. inopinata Bousek

— Abdomen more than twice as long as wide, conical epipygidial keel distinctly longer than the distance between the pygostyles; on the slender antennae the pedicel at least three times as long as wide; last funicle segment distinctly longer than wide; spots on the fore wings lighter..... H. amamiana Bousek

20. Coxae reddish yellow..... 21

-- Coxae black..... 22

21. Forewings with round colorless spot under radial vein; scape less than 3 times as long as wide; pits on thorax sparsely arranged with interspaces as wide as their diameter..... H. nicula (Nik.)

-- Forewings with wide colorless longitudinal area below radial vein; scape 3 times longer than wide; pits on thorax more close with interspaces less than their diameter..... H. caduca (Nik.)

22. Forewings with white diameter ring under stigmal vein; carinae on tergite I almost twice long than distance between them.....23

-- Forewings with 2 white spots below radial veins; carinae on last tergite I almost equal, the distance between them..... H. nadiana (Nik.)

23. Crown very short with distinct keel; puncts on thorax more large, close with interspaces of pits less than their diameter; carinae on tergite I almost length twice the distance between them..... H. nebula (Nik.)

-- Crown not very short, puncts on thorax more shallow and close, interspaces more than their diameter, smooth; carinae on the tergite I little short, almost twice long than the distance between them..... H. confusa (Nik.)

Hockeria nikolskayii sp. n.

(Figs. 55-61)

Female:

Head (Figs. 55, 56).- Black, wider than long in facial view (1.05:0.83), as wide as thorax, surface compactly pitted, interspaces of pits fairly narrow and finely carinate; eyes glabrous; scrobe cavity uppitted, rugose with indistinct margins, apex not reaching front ocellus; inter-antennal projections thin, distinctly projecting forward; frontogenal sutures distinct; height of malar space lower than the major axis of eyes; ocelli in obtuse angled triangle.

Antennae (Fig. 57).- Black, scape less than nine times as long as wide (0.55:0.066), as long as pedicel to half of 4th funicle segment combined; pedicel twice as long as wide (0.14:0.07), annelus one and a half times as wide as long; 1-5 funicle longer than wide, sixth as long as wide, seventh slightly wider than long; club more than twice as long as wide (0.23:0.11), longer than preceding two funicle segment combined.

Thorax .- Black, tegulae reddish brown, compactly pitted on dorsal surface, pits comparatively wide on scutellum, interspaces of pits narrow, finely carinate, scutellum convex, gently declined posteriorly, slightly emarginate at apex; propodeum

(Fig. 58) with distinct submedian, accessorial and sublateral carinae; with silvery white pubescence.

Fore wings (Fig. 59).- Hyaline at apex and base, remaining central portion blackish brown with a round whitish spot with white pubescence situated near stigmal vein, two and one-half times as long as wide (1.9:0.8), submarginal less than five times as long as marginal (0.89:0.19), marginal about twice of post marginal (0.19:0.1), stigmal very short; marginal fringe short.

Hind wings .- Hyaline, about three and a half times as long as wide; marginal fringe short.

Fore legs.- Coxae black, rest part blackish brown.

Middle legs.- Coloration same as on fore legs.

Hind legs.- Blackish brown, coxa and femur reticulate, densely pubescent, outer ventral margin of femur (Fig. 60) with two lobes, one rounded and basal somewhat triangular, lobes with a series of truncated teeth.

Gaster (Fig. 61).- Reddish brown, dorsal surface somewhat dark, tergite I occupying about one and two-third of gaster, almost glabrous, tergite II almost glabrous, 3-7 terites densely setose; subgenital paate with a central keel, with two lateral keels anteriorly, posterior margin with a deep notch

PLT. - IX

Hoggeria nikolskayi sp.n., ♀

(Figs. 55 - 61).

55. Head (Lateral view)

56. Head (Dorsal view)

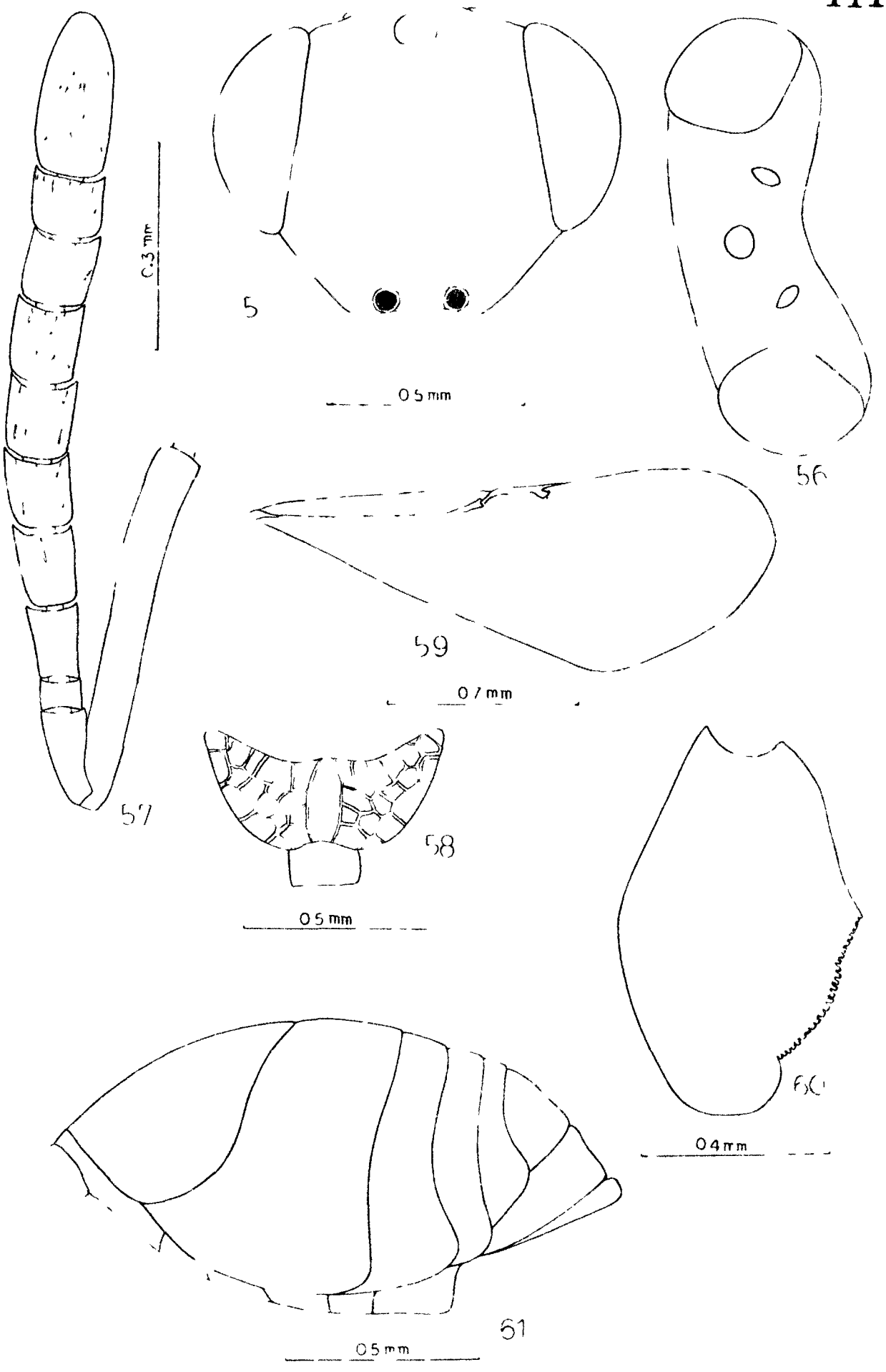
57. Antenna

58. Prepodeum

59. Fore wing

60. Hind femur

61. Coxter.


0.3 mm
55
0.5 mm
56
59
0.1 mm
57
58
0.5 mm
60
0.4 mm
61
0.5 mm

in the middle; outer plates of ovipositor narrow at base, narrowly rounded at apex, with a thick muscular ridge along dorsal margin; first valvifers subtriangular, with apical and basal angles at the same level; second valvifers long and narrow, third valvulae movably articulated with second valvifers.

Female length: 2.7 mm.

Holotype: ♀, India, Uttar Pradesh, Aligarh, ex. Spilosoma sp. on Pisum vulgaria L., 5.12.1978. (Cat. No. K- 34).

Paratype: ♀ (Data same as for holotype).

Hookeria vulgaria sp.n.

(Figs. 62-67)

Female:

Head (Fig. 62)-- Black, wider than long in facial view (1.35 : 0.85) slightly wider than thorax, surface compactly pitted, inter spaces of pits as wide as their diameter; compound eyes glabrous; scrobe cavity shallow, rugose, with indistinct margins, apex not reaching front ocellus; inter-antennal projection thin, fronto-genal sutures distinct; height of malar space lower than the major axis of eyes; pre and post orbital carinae absent; ocelli in obtuse angled triangle; right mandible tridentate, left bidentate.

Antennae (Fig. 63).- Black, scape less than eight times as long as wide (0.55: 0.065), as long as pedicel to third funicle segment combined; pedicel more than twice as long as wide (0.14 : 0.06); annellus wider than long, funicle 1-4 longer than wide, 5-6 as long as wide, 7th wider than long; club 2-segmented, rounded at apex about twice as long as wide (0.23 : 0.12), longer than preceeding two funicle segments combined.

Thorax.- Black, moderately pitted on dorsal surface, pits on pronotum and scutum comparatively narrow and with wide interspaces, as wide as their diameter, on scutellum pits more wider and more closely set, with fine interspaces, interspaces fairly carinate, apex of scutellum gently emarginate and bilobed; propodeum (Fig. 64) with moderately distinct submedian, accessorial and subiateral carinae; with silvery white pubescence.

Fore wings (Fig. 65).- Almost hyaline at basal and apical one third, remaining central part rather blackish brown, with a rounded whitish spot with white pubescence situated near stigmal vein; less than three times as long as wide (1.83 : 0.67); sub marginal four and a half times as long as marginal (0.79 : 0.19), post marginal short about one-third of marginal (0.19 : 0.06), stigmal short; marginal fringe short.

PLATE - X

Hookeria vulgaris sp.n., ♀

(Figs. 62- 67)

62. Head (Dorsal view)

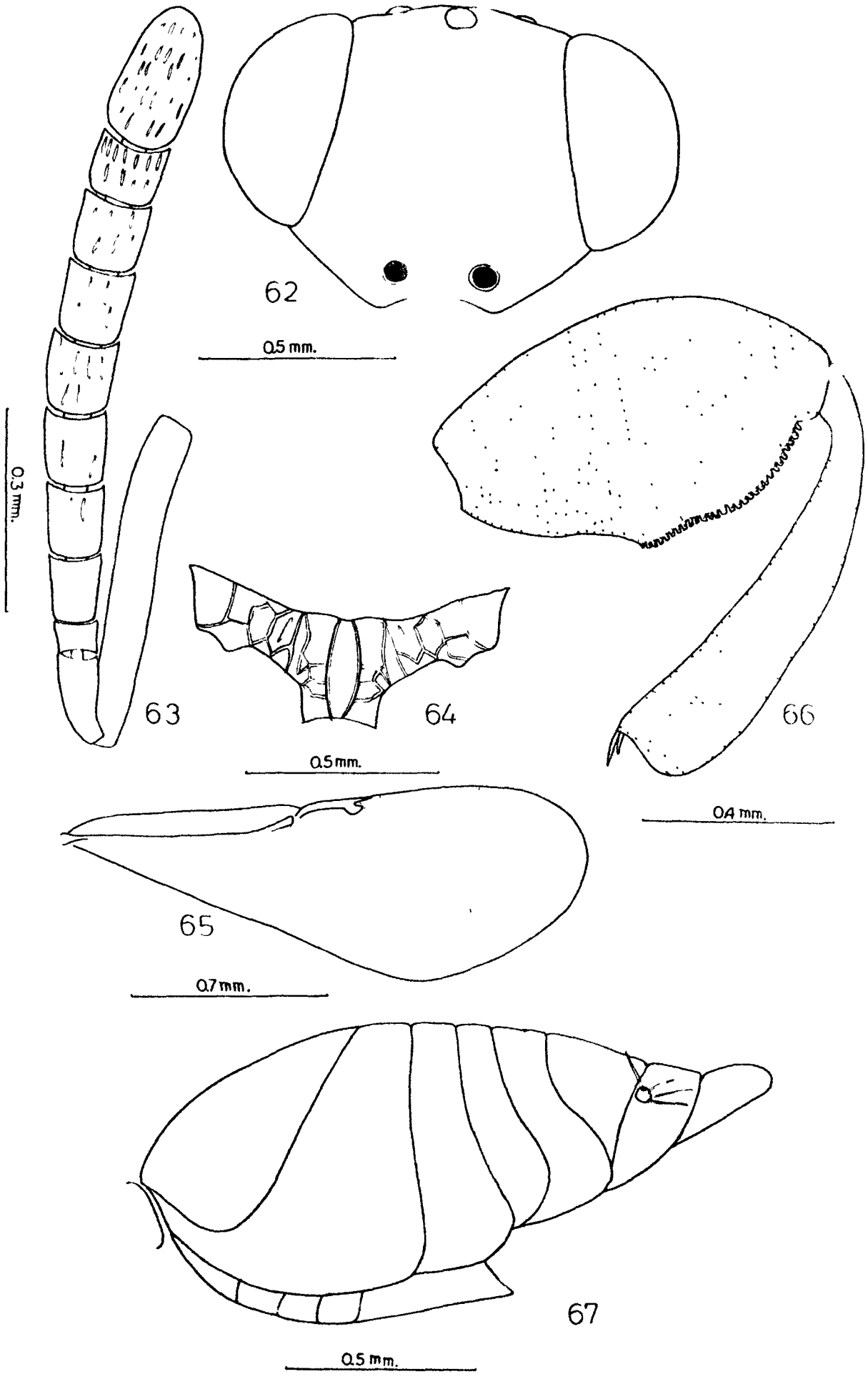
63. Antenna

64. Propodeum

65. Fore wing

66. Hind femur and tibia

67. Gaster.


62
0.5 mm.
0.3 mm.
63
64
0.5mm.
66
0.4 mm.
65
0.7mm.
67
0.5 mm.

Hind wings .- Hyaline, about three and a half times as long as wide; marginal fringe short.

Fore legs .- Black except tarsi being blackish brown.

Middle legs.- Coloration same as on fore legs.

Hind legs .- Black, coxae, femora and tibiae densely pubescent; outer-ventral margin of femora (Fig. 66) with two lobes, proximal lobe near middle somewhat pointed, apical lobe rounded, lobes with distinct truncated teeth.

Gaster (Fig. 67).- Black, tergite I, one and one-fourth as long as greater, impunctate; glabrous, tergite II sparsely setose near middle; lateral surfaces glabrous, 3-7 tergites densely setose; subgenital plate with a keel in the middle, with two lateral lobes on anterior margin, posterior margin with a wide notch in the middle; outerplates of ovipositor narrow at base, narrowly truncated at apex, with a thick muscular ridge along dorsal margin; first valvifers sub triangular with apical and basal angles at the same level, second valvifers long and narrow, third valvulae movably articulated with second valvifers.

Female length: 2.9 mm.

Holotype: ♀, India, Uttar Pradesh, Aligarh, ex. Spiloscosa sp. on Pisum vulgaris L., 7.xii.1976. (Cat.No. K-81).

Paratype: ♀, (Data same as for holotype).

Ninnohockeria Habu

Genotype: Ninnohockeria ishii Habu (monobasic and Orig. desig.)

Habu, 1960: Bull. Nat. Inst. Agri. Sci. Ser. C.No. 11: 234.
Habu, 1962: Fauna Japonica, 83.

Genus Ninnohockeria Habu is based on the following characters:

Head and scrobe cavity not distinctly deep; pre-orbital carinae absent, compound eyes moderately large and convex, glabrous; antennal sockets a little remote from clypeus; frons seen from lateral sides not concave above antennal sockets; fronto-genal sutures present; mandibles tridentate; antennae long, ring segment quadrate in male, thin in female, funicle thickened in male, not in female, club short; scutellum not bifid at apex; propodeum narrow, without tooth on lateral costae, median areola distinct; forewings with brownish patch, post marginal vein absent; hind femora with two lobes, following comb like teeth on outer-ventral margins; tergite I impunctate with some longitudinal carinae at basal area.

This genus is known only for Japan, and is recorded for the first time from India. The species under discussion differs.

from the only described species in the genus in the following manner:-

N. ishii Habu, ♂	*N. sativa* sp.n. ♂
1. Tegulae reddish brown	1. Tegulae black
2. Forewings with dark patches	2. Fore wings with faint patches.
3. Hind legs reddish brown	3. Hind legs black
4. Posterior margin of pronotum without fringes	4. Posterior margin of pronotumm with fringes.
5. Tergites impunctate	5. Tergites punctate

Ninnohockeria sativa sp.n.

Male

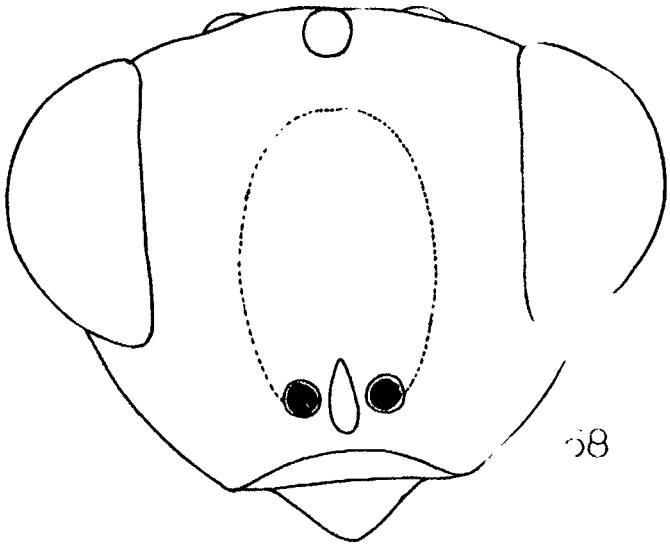
Head (Figs. 68, 69).- Black, as wide as thorax, wider than long in facial view; surface rather densely pitted with shallow pits, with silvery white pubescence; scrobe cavity narrow, margins obscure, fairly shallow, apex far remote from front-ocellus; inter-antennal projection narrow, fronto-genal sutures distinct, fronto-genal angle rather distinct, hind angle completely rounded off; height of malar space less than the major axis of eyes; genae shallowly depressed along ventral and hind margins; ocelli in obtuse angled triangle; mandibles tridentate.

Antennae (Fig. 70).- Black, scape short not reaching front ocellus, slightly more than four times as long as wide (0.47 : 0.11), as long as pedicel to 2nd funicle segment combined; pedicel slightly longer than wide; ring segment transverse, first funicle one and one-half times as long as wide (0.22 : 0.16), 2-7 funicle almost same in width, with decrease in length distad, longer than wide; club 2-segmented twice as long as wide (0.26 : 0.13), longer than preceeding funicle segment.

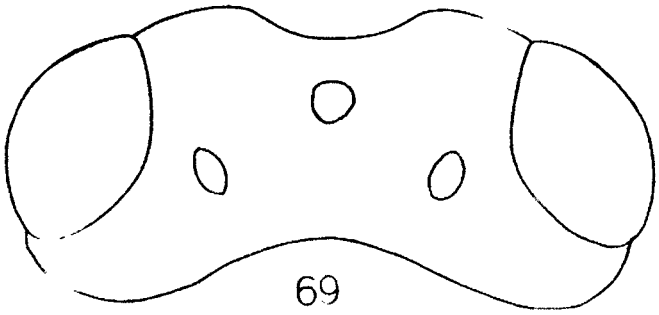
Thorax.- Black, shallowly pitted with silvery white pubescence; pronotum with a row of fringes along posterior margin, scutellum rather high in profile, apex faintly emarginate; propodeum (Fig. 71) almost flat, gently declined posteriorly with distinct, submedian, sublateral and accessorial carinae; lateral costae without tooth.

Fore wings.- Almost hyaline, area below marginal and sub marginal veins with obscure brownish patches, about two and a half times as long as wide (2.08 : 0.85), submarginal three and one-half times as long as marginal (0.9 : 0.24), post marginal shorter than marginal (0.24 : 0.31), stigmal very short (Fig. 72); marginal fringe very short.

Hind wings.- Hyaline about three and a half times as long as wide; marginal fringe short.

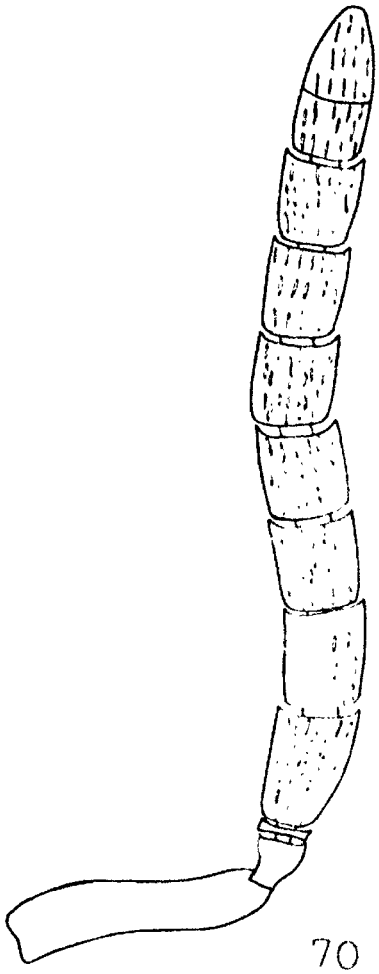


68



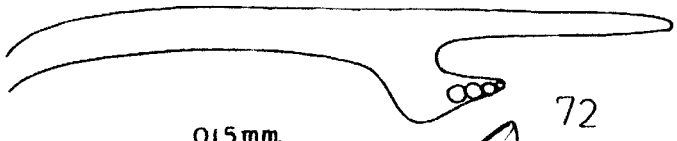
69

0.5mm.



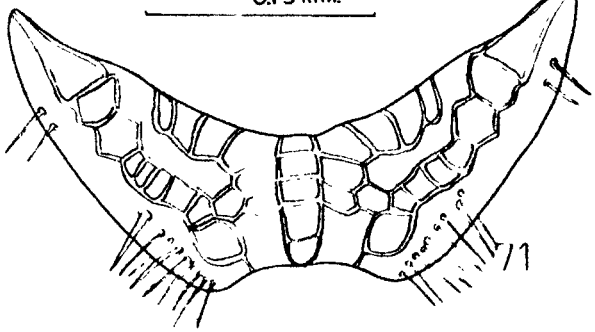
70

0.5 mm.



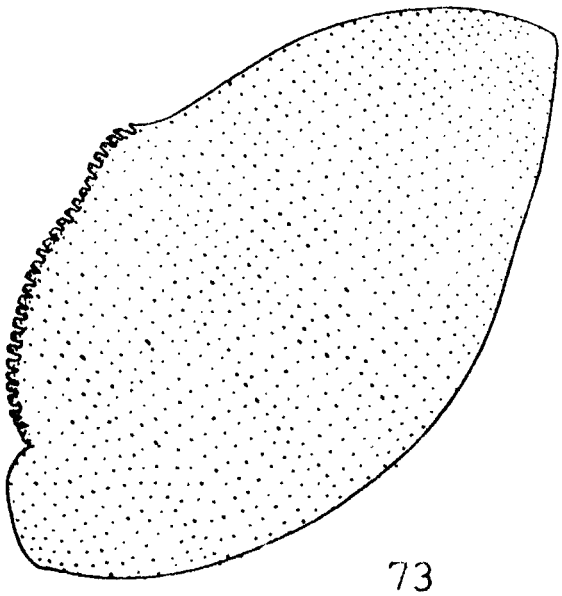
72

0.15 mm.



71

0.5mm.



73

0.5 mm.

PLATE - XI

Nipponocoris sativa sp.n., ♀

(Figs. 68 - 73)

68. Head (Facial view)

69. Head (Dorsal view)

70. Antenna

71. Propodeum

72. Part of venation of forewing

73. Hind femur

Fore legs.- Black, tarsi blackish brown.

Middle legs .- Coloration same as on fore legs.

Hind legs .- Black, coxae and femora densely pubescent on outer and inner surfaces, outer-ventral margin of femora (Fig. 75) with two prominent rounded lobes, series of dense teeth arising from first lobe and extending upto apex.

Gaster.- Black, tergites densely punctate, tergite I about one-half of gaster, with rounded apex, sparsely setose on postero-lateral surfaces, tergites 2-5 densely setose on lateral surfaces, last tergite densely setose, tergite I with a short fovea at base with two short carinae.

Male length 2.9 mm.

Holotype: ♂, India, Uttar Pradesh, Aligarh, ex. Xanthomus ochronbenus Meyr., on Pisum sativum L., 9.xi.1976 (Cat. No. K - 35 x).

Genus Antrocephalus Kirby, 1883.

Genotype: Halticella fasciocornis Walker, 1871 (Orig. Desig.)

Kirby, 1884: Journ. Linn. Soc. London, Zool. 17: 54, 64.- Dalla Torre, 1898: Cat. Hym. 5: 396.- Kieffer, 1904: Berl. Ent. Zeitschr. 49: 246.- Schmiedeknecht, 1909: Gen. Ins. Fas. 97, Hym. Chalcididae: 1.- Masi, 1928: Bol. Soc. Ent. Ital. 60: 11.- Schmitz, 1946: Ins. Parcs. Nat. Congo Belge: 192.- Boucek, 1951: Acta. ent. Mus. nat. Pragae, 22, No. 388: 53.- Nikolskaya, 1952: Opred. Faune SSSR, 44: 96.- Nikolskaya, 1960(a): Akad. Nayk CCCP, 27: 223.- Habu, 1960: Bull. Nat. Inst. Agr. Sci. ser. C.No. 11: 251.- Nikolskaya, (1960b): Zool. Inst. Akad. Nayk CCCP, no. 76, 5: 100.- Habu, 1961: Fauna Japonica: 93.- Peck et al., 1964: Mem. ent. Soc. Canad. no. 34: 14.- Masi, 1974: Mem. Sch. Ent. St. John Coll., Agra, no. 3: 19.

Synonyms:

Antrocephalus Kirby, 1883: Jour. Linn. Soc. Lond. Zool. 16: 54,63.

Dilla Strand, 1911: Arch. Naturges. 77: 210.

Genotype: Antrocephalus rufinus Kieffer (monobasic & orig. desig.).

Dilliaca Ghesquiere, 1946: Rev. Zool. Bot. Afr. 39: 367.

(for Dilla Strand, nec. Fischer de Waldheim).

Sabatiella Masi, 1929: Boll. Lab. Ent. R. Ist. Agr. Bologna, 2: 167.

Genotype: Sabatiella nigra Masi (Orig. desig.).

The genus Antrocephalus was described by Kirby in 1871 with Halticella fasciocornis Walker, 1871 as its type. Some authors consider Stomatocerus Kirby, 1882 with Halticella liberator Walker, 1862 as its type, related and congeneric to Antrocephalus. The present writer is in agreement with Boucek (1951) in following Masi (1928) for placement of species with fully developed post marginal vein under Antrocephalus Kirby and species with a rudimentary post marginal vein under Stomatocerus Kirby.

Genus Antrocephalus Kirby can be distinguished by the following characters:

Head slightly triangular anteriorly, depression on frons deep, with well developed pre orbital carinae, reaching fronto-genal sutures below compound eyes; antennal sockets directly above fronto-clypeal suture in female, usually remote from fronto-clypeal suture in male; hind femora with very small angular process, outermargin minutely serrated.

Mani et al. (1974) described two species, one based on female, another based on male under the generic name Sabatiella which is a synonyms to Antrocephalus. As such new combinations are proposed for Sabatiella neduvamiensis Mani & Dubey and Sabatiella nepalensis Mani & Dubey. A new species is also described.

Key to species of the genus Antrocephalus Kirby

1. Hind femora rust red..... 2

— Hind femora black..... 8

2. Last abdominal tergite with the tip of ovipositor, longer than penultimate; hind femora with distinct triangular denticles..... 3

— Last abdominal tergite with tip of ovipositor not longer than penultimate; hind femora with indistinct triangular denticles (♀ = 4-6 mm.; ♂ = 3.6-4 mm.)..... ..... A. hyposonyxius Mani

3. Antennae reddish..... 4

— Antennae predominantly black..... 5

4. Fore wings almost colorless; tergite I punctate throughout; (♀ = 6 mm.)..... A. Yingana Nikolskaya

-- Fore wings with reddish brown spot under marginal vein; tergite I impunctate, with few setae on posterior margin, almost glabrous, length of female 5.4 mm..*A. indicus* sp.n.

5. Scutellum with extremely long apical denticles; hind femur with three distinct protrusions..... 6

-- Scutellum slightly incised apically; hind femur with slightly developed protrusions or without proximal lobe on outer ventral margin..... 7

6. Head punctation deeper; thoracic punctation larger, but sparse; first funicle twice as long as annellus; scutellum with apical denticles, slightly close together; median segment with lateral denticles; last abdominal tergite of same length as penultimate.....
.....*A. manausa* Nikolskaya

-- Head punctation superficial; thoracic punctation shallower but dense, first funicle more than twice length of annelus scutellum with apical denticles widely separated; median segment without lateral denticles; last abdominal tergite longer than penultimate, female length: 7 mm.....
..... *A. gracilis* Nikolskaya

7. Hind femora with slightly developed protrusions; last abdominal tergite three-fourth length of penultimate; thoracic punctation fine, thick; length of female 8 mm....
..... *A. turkestanicus* Vasi

-- Hind femora without proximal lobe at basal one-third; last abdominal tergite one-third length of penultimate; interspaces of pits on thorax wider, almost as wide as diameter of pits on scutellum; female length 3.5 - 5.5 mm..... A. spinalis (Walker). * and A. Nepalensis (Mani & Dubey) Comb. n.

8. Scutellum with distinct teeth or projection at apex.....9

-- Scutellum without distinct teeth or projection at apex..10

9. Wings almost entirely hyaline, female length 3.6-4.0 mm... ..... A. patoi Hatu

-- Wings entirely slightly smoky brown, with two unclearly delimited darker spots at the posterior margin, first spot at the marginal vein, second spot behind the end of marginal vein; female length 7 - 7.5 mm..... .....A. hafferi Boucek

10. Hind femora with proximal lobe on outer ventral margin..11

-- Hind femora without proximal lobe on outer-ventral margin; male length 3.75 mm..... ..... A. naducaniensis (Mani & Dubey) Comb. n. (Sabethiella naducaniensis Mani & Dubey)

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* May prove to be synonyms, types not seen.

11. Hind femora with proximal lobe at basal one-third on outer ventral margin; interspaces of pits on thorax not or weakly carinate, without distinct microsculpture.....12

-- Hind femora with proximal lobe at middle on outer ventral margin; interspace of pits on thorax evidently carinate, with distinct microsculpture in female, female length: 2.9 - 4.1 mm..... A. japonicum Habu

12. Scutellum weakly bilobed at apex; compound eyes glabrous; fronto-genal sutures present; female length 4.6 - 5.7 mm..... A. ishii Habu

-- Scutellum widely emarginate and bilobed at apex; compound eyes setose; fronto-genal sutures absent. Female length: 3.0 - 4.0 mm..... A. murakamii Habu

Antrocephalus indicus sp.n.

(Figs. 74-80)

Female:

Head (Fig. 74).- Black, except eyes, ocelli and maxillae being light yellow, mandibles reddish brown, wider than long in

facial view (0.79 : 0.66), densely pitted, pits shallow, shagreened with silvery white hairs; scrobe cavity delimited, deeply excavated, attaining front ocellus, with transverse striations; preorbital carinae well developed, dorsal part uniting behind front ocellus, ventral part reaching fronto-genal sutures; fronto-genal sutures carinate, carinae on reaching ventral margin of eyes bifurcate, one end joins with pre-orbital carinae, second part turns round compound eyes and joins post-orbital carinae; malar space shorter than the longitudinal diameter of eyes (0.29 : 0.22); ocelli in obtuse angled triangle, basal ocellus removed from eye rim and occipital margin by less than its own diameter; maxillary palpi 4-segmented, labial palpi 2-segmented, mandibles tridentate.

Antennae (Fig. 75).- Reddish brown; scape less than seven times as long as wide (0.74 : 0.11), as long as pedicel to half of 4th funicle segment combined; pedicel twice as long as wide (0.18: 0.09); annellus wider than long; 1-4 funicle segments longer than wide, remaining as long as wide; club 3-segmented, more than twice as long as wide (0.24 : 0.11), less than preceding 3 funicle segments combined.

Thorax.- Black, except tegulae being reddish brown, shagreened with silvery white hairs, compactly pitted on dorsal

side, interspaces of pits narrow, not distinctly carinate; pronotum shallowly depressed at middle, anterior carinae rather distinct; scutellum abruptly declined near apex; propodeum (Fig. 76) short, fairly declined posteriorly with submedian, sublateral and accessory carinae distinct.

Fore wings (Figs. 77, 78).- Smoky with unclearly delimited brown spots near marginal vein; slightly less than three times as long as wide (2.7 : 0.95); submarginal, marginal post marginal and stigmal veins measure 0.95; 0.12; 0.1; 0.06 mm. respectively; marginal fringes short.

Hind wings.- Hyaline, three and one-half times as long as wide; marginal fringes short.

Fore legs.- Reddish brown.

Middle legs.- Reddish brown.

Hind legs.- Reddish brown except teeth and inner margin of tibia black; outerface of coxae and femora densely pitted with silvery white pubescence; basal two-third part on ventral surface of femora with two faint lobes and a series of comb like blunt teeth (Fig. 79).

Gaster (Fig. 80).- Black, acuminate at apex; tergite I with short carinae at base; second tergite with setae on lateral

PLATE - XII

Antrocephalus indicus sp.n., ♀

(Figs. 74 - 80)

74. Head (Facial view)

75. Antenna

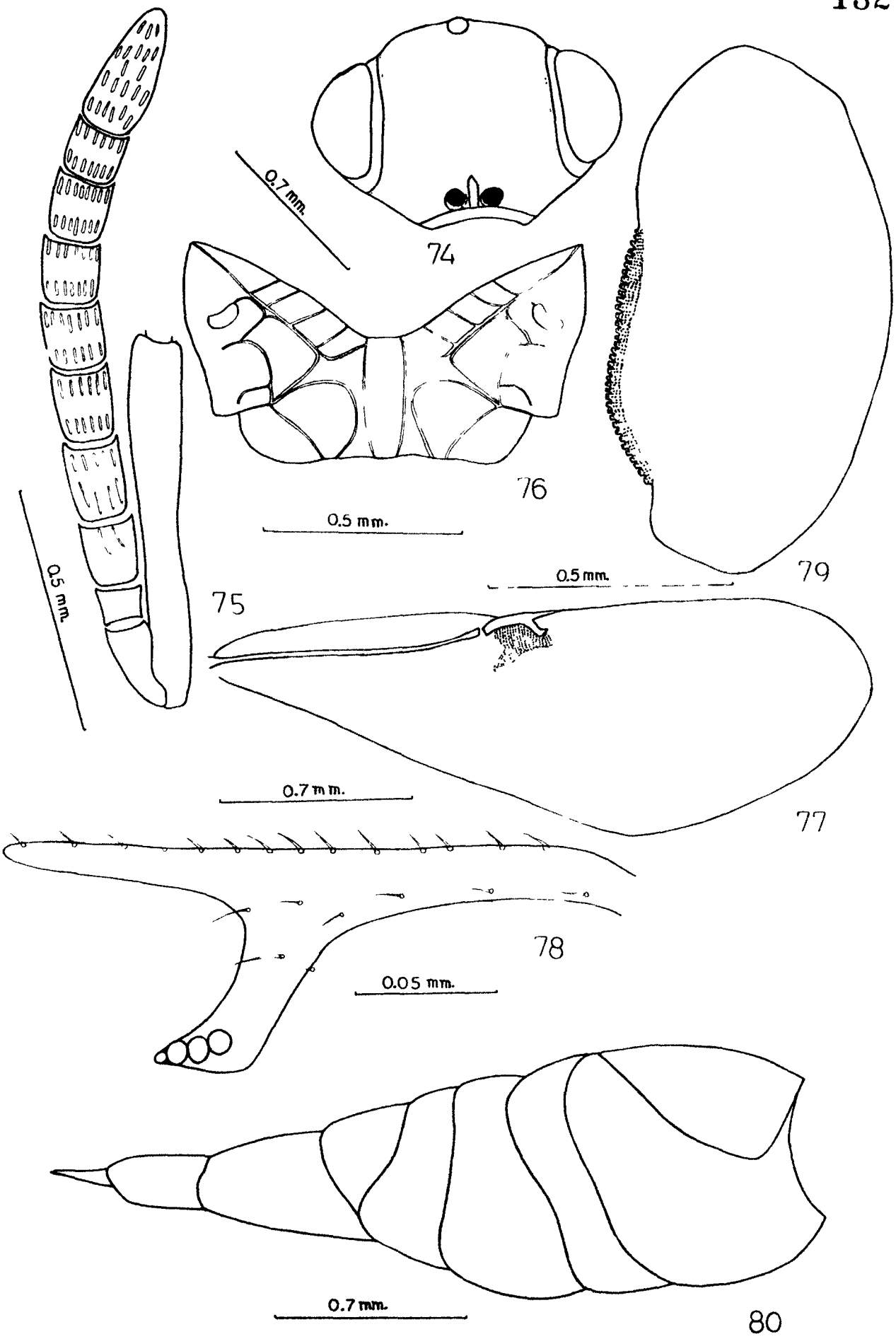
76. Fore wing

77. Propodeum

78. Part of venation of forewing

79. Hind femur

80. Gaster


0.7 mm.
74
0.5 mm.
76
0.5 mm.
79
0.5 mm.
75
0.7 mm.
77
0.05 mm.
78
0.7 mm.
80

sides; subgenital plate with two lobes on anterior margin, posterior margin with a notch in the middle; ovipositor concealed. Outerplates of ovipositor truncated at base, rounded at apex with a thick muscular ridge along dorsal margin; first valvifere subtriangular with anical and basal angles at the same level; second valvifere long and narrow, third valvulae movably articulated with second valvifere.

Female length: 5.4 mm.

Holotype: ♀, India, Uttar Pradesh, Aligarh, ex. Marasmia trapezalis Guen. on Zea mays L., 30.xii.1976, (Cat. No. K - IG).

Paratypes: 3 ♀♀, (Data same as for holotype).

Genus *Tainania* Masi, 1929.

Genotype: *Tainania acutiventris* Masi (Original Designation).

Masi, 1929: Boll. Lab. Ent. R. Ist Suppl. Agr. Bolonga, 2: 159.- Nikoslkaha, 1960(b): Zool. Inst. Akad. Nayk. CCCP, no. 76: 46.- Habu, 1960: Bull. Nat. Inst. Agr. Sci. Ser. C.No. 11: 277.- Habu, 1962: Fauna Japonica: 112.- Narendran, 1977: Entomophaga 22(3): 295.

Head with pre orbital carinae well developed, dorsal part running transversely behind front ocellus: carinae on outerside of antennal sclerites distinct, uniting pre-orbital carinae: postmarginal longer than marginal: hind femora with two weak, rounded lobes on outer-ventral margin, first one almost at middle.

Genus *Tainania* has been recorded for the first time from India and 4 new species *T. vitata*, *T. brevicornis*, *T. hyalonemia* and *T. indica* has been described.

Key to species of the genus Tainania Masi, based on females:

1. Scutellum with a longitudinal groove..... 2

— Scutellum without a longitudinal groove..... 4

2. Legs black..... 3

— Legs reddish; scape 7 times as long as wide; pedicel twice as long as wide, funicle segments longer than wide; hind femora with two weak rounded lobes.... T. yitata sp.n.

3. Antennae thin, inter-antennal projection (♂) narrowly but distinctly separated from fronto-clypeal suture..... T. hakonensis (Ashm.)

— Antennae comparatively thick; inter-antennal projection widely but indistinctly separated from fronto-clypeal suture..... T. laeviscia Masi

4. Wings hyaline 5

— Wings fumate; pedicel as long as first funicle segment; annellus and 7th funicle segment subsquare, club slightly longer than 7th funicle segment; abdomen as long as head and thorax combined..... T. acutiventris Masi

5. Hind femur with 2 faint lobes..... 6

— Hind femur with 3 distinct lobes; pedicel wider than long, ring segment transverse; funicle segments sub-square.....T. indica (♀)sp.n.

6. Antennae reddish; 1st abdominal tergite glabrous; last abdominal tergite with the tip of ovipositor longer than penultimate..... T. brevicornis sp.n.

— Antennae black except scape and pedicel red; 1st abdominal with few setae on lateral surface; last abdominal tergite with the tip of ovipositor as long as penultimate..... T. hyalomennia sp.n.

Tainania vitata sp.n.

(Figs. 81, 88, 92, 96, 100, 104-105, 106)

Female:

Head (Fig. 81).- Black, eyes, ocelli and maxillae yellow, mandibles reddish; wider than long in facial view (1.45 : 1.3), densely pitted, pits shallow, interspaces of pits carinate, pubescence silvery white; scrobe cavity deeply excavated reaching front ocellus, with striated surface, and carinate margins; pre-orbital carinae distinct dorsal part running

transversely behind front ocellus, ventral part uniting just below antennal sockets; fronto-genal sutures crinate, carinae reaching ventral margin of eyes, bifurcate, below compound eyes, a short one reaching pre-orbital carinae and hind one rounding along hind margin of compound eyes as posterbital carinae; height of malar space shorter than the longitudinal diameter of eyes (0.5 : 0.65); ocelli arranged in obtuse angled triangle, basal ocellus removed from eye rim and from occipital margin by about less than its own diameter; maxillary palpi 4-segmented, labial palpi-2-segmented; mandibles tridentate.

Antennae (Fig. 88).- Reddish brown, except basal half of scape, pedicel and 4-7 funicle segments black; scape about seven times as long as wide (0.76 : 0.11); as long as pedicel to third funicle segment combined; pedicel about twice as long as wide (0.19 : 0.1), annellus as long as wide; 1- 7 funicle segments longer than wide with decrease in length distad; club less than 3 times as long as wide (0.36 : 0.13), shorter than preceding three funicle segments combined; third funicle to last club segment with few sensoria.

Thorax.- Black except pinkish at tegulae, densely pitted with rather small pits on dorsal side; inter-spaces of pits wide and weakly carinate on lateral parts of mesoscutum;

pronotum shallowly depressed at middle, anterior carinae distinct at lateral parts, turning faint inwards and obliterated near middle; scutellum forked at apex; propodeum (Fig. 98) with sub median, sub lateral and accessorial carinae distinct; shagreened with silvery white hairs.

Fore wings (Fig. 96).- Smoky, dark brown near marginal vein; about three times as long as wide (0.27 : 0.09); postmarginal very long, longer than marginal (0.3 : 0.25), stigmal (0.08) very small, coming out at an angle and then becoming parallel to wing margin;

Hind wings.- Hyaline, about four times as long as wide, marginal fringe short.

Fore legs .- Reddish brown, claws dark.

Middle legs .- Coloration same as on fore legs.

Hind legs .- Reddish brown except teeth on femora and ventral margin of tibiae black; outerside of coxae and femora minutely and densely punctate, shagreened with silvery white hairs; femora with two weak rounded lobes on basal two-third with a series of comb like, blunt dense teeth occupying rounded lobes on ventral margin (Fig. 100).

Gaster (Fig. 106).- Black almost as long as thorax, tergite I occupying one-half of gaster with short carinae at base, posterior margin weakly rounded; tergite II with bristled punctures and microsculpture on lateral parts; subgenital plate (Fig. 104) reddish brown with two lateral lobes on anterior margin and a deep notch on posterior margin; mid longitudinal carina complete; ovipositor (Fig. 105) concealed; first valvifers subtriangular with apical and basal angles at the same level; second valvifers long with thickened margins third valvulae somewhat triangular broadly rounded at apex; movably articulated with second valvifers; outerplates of ovipositor narrow at base, rounded at apex with a thick muscular ridge along dorsal margin.

Female lengths 5.4 mm.

Holotype: ♀, India, Uttar Pradesh, Aligarh, ex. Xanolenkma ashmeadanum Meyr. on Pisaeum sativum L., 10.xii.1976. (Cat. No. K-Y).

Paratypes: 5 ♀♀, (Data same as for holotype).

Tetramia brevicornis sp.n.

(Figs. 82, 83, 89, 93, 99, 101, 107)

Female:

Head (Figs. 82-83).- Black, wider than long in facial view (0.83 : 0.63), as wide as thorax, surface rather densely and deeply pitted, pits with finely carinate interspaces, scrobe cavity rugose; fronto-genal suture finely carinate, pre-orbital carinae distinct; inter-antennal projection narrow and distinctly projecting; eyes glabrous, major axis of eyes longer than the height of malar space; ocelli in obtuse angled triangle.

Antennae (Fig. 89).- Reddish brown, scape seven and a half times as long as wide (0.39 : 0.050), as long as pedicel to third funicle segment combined; pedicel about two and a half times as long as wide (0.11 : 0.041); ring segment subsquare; 1-3 funicle segments longer than wide, 4-7 as long as wide; club less than three times as long as wide (0.20 : 0.075), less than preceding three funicle segments combined.

Thorax.- Black, tegulae reddish brown, dorsal surface densely pitted, pits more wider on scutellum; interspaces of pits narrow and finely carinate, pronotum shallowly depressed on middle, anterior carinae distinct at lateral parts, turning faint inwards and obliterated near middle of pronotum; scutellum gently declined posteriorly with apex somewhat rounded; propodeum flat with distinct submedian, accessorial and sub-

lateral carinae, areolae deep, lateral costae with blunt projections (Fig. 95).

Fore wings.- Hyaline, slightly less than three times as long as wide (0.49 : 0.16); submarginal about ten times as long as marginal (0.57 : 0.055), postmarginal longer than marginal (0.08 : 0955), stigmal very short (0.035) (Fig. 99), marginal fringe short.

Hind wings.- Hyaline, less than four times as long as wide; marginal fringe short.

Fore legs .- Coxae black, femora and tibiae dark brown except at apex and base, apex and base of femora and tibiae and tarsi reddish brown.

Middle legs.- Coloration same as on fore legs.

Hind legs.- Coxae, femora, dark brown, tibiae and tarsi reddish brown; ventral side of coxae and femora fairly [illegible] owing to distinct dense reticulations or striations, densely pubescent, ventral margin without distinct lobe, apical half with distinct, truncated teeth (Fig. 101).

Gaster (Fig. 107).- Black, almost as long as thorax, tergite I occupies one-third of gaster, almost glabrous, base with short but distinct carina on each side of median fovea,

carinae as long as foveae, posterior margin of foveae weakly rounded, tergite II with very few sparse setae, 3-6 tergites, sparsely setose on posterior margin, last tergite densely setose; subgenital plate with lateral lobes on anterior margin, posterior margin with a deep notch in the middle; outerplates of ovipositor narrow at base, narrowly rounded at apex, with a thick muscular ridge along dorsal margin; first valvifers subtriangular with apical and basal angles at the same level, second valvifers long and narrow, third valvulae movably articulated with second valvifers.

Female length: 2 mm.

Holotype: ♀, India, Uttar Pradesh, Aligarh ex. Aphelenchus sp. on Eragrostis somalensis L., 22.xi.1979. (Cat. No. K-3).

Paratypes: 2 ♀♀. (Data same as for holotype).

Tainania Avalonensis sp.n.
(Figs. 84, 85, 91, 95, 98, 102, 108)

Female:

Head (Figs. 84-85).- Black, wider than long in facial view (1.02 : 0.98), as wide as thorax, surface deeply pitted with narrow interspaces and fine carinae between pits, area between pre-orbital carinae and scrobe cavity with compact shallow pits, scrobe cavity rugose and delimited, eyes glabrous;

pre orbital carinae distinct, reaching antennal sclerites; inter-antennal projection distinctly projecting outside; fronto-genal sutures carinate, carinae relatively fine, reaching ventral margin of compound eyes; height of smaller space less than the major axis of eyes; ocelli in obtuse angled triangle left mandible tridentate right bidentate.

Antennae (Fig. 91).- Scape, pedicel and ring segment reddish brown, funicle and club dark, scape seven and a half times as long as wide (0.69 : 0.09); pedicel about two and half times as long as wide (0.19 : 0.07); ring segment sub-square; 1-5 funicle segments longer than wide, decrease in length dicted, 6-7 funicle segments as long as wide; club two and a half times as long as wide (0.29 : 0.12), as long as funicle segments 7, 6 and half of 5th combined.

Thorax.- Black, tegulae reddish brown, densely pitted with rather shallow pits, interspaces between pits fine, carinate; pronotum shallowly depressed at middle, anterior carinae distinct on lateral parts, turning faint inwards and obliterated near middle of pronotum; scutellum gently declined at apex, with comparatively wide pits, slightly bilobed at apex; propodeum comparatively short, flat, gently declined posteriorly with submedian, accessorial and sub-lateral carinae distinct, median areola deep with transverse carinae, spiracular areas delimited posteriorly by faint transverse carina, lateral costae with a blunt projection (Fig. 95); shagreened with silvery white hairs.

Fore wings.- Hyaline, less than three times as long as wide (1.63 : 0.65) sub marginal about four times of marginal vein (0.62 : 0.16); marginal as long as postmarginal; stigmal short (Fig. 98); marginal fringe very short.

Hind wings.- Hyaline, less than four times as long as wide; marginal fringe short.

Fore legs.- Coxae, femora except apex and base black, apex and base of femora, tibiae and tarsi reddish brown.

Middle legs.- Coloration same as on fore legs.

Hind legs.- Coloration same as on fore legs, ventral side of coxae and femora fairly rough owing to distinct dense reticulation or striations; femora with proximal lobe at basal one third on outer ventral margin, lobes with distinct truncated teeth (Fig. 102).

Gaster (Fig. 108).- Black, almost as long as thorax, tergite I rounded at apex, almost glabrous, with very few setae on lateral sides, base with short but distinct carina on each side of fovea, carinae as long as fovea but fairly shorter than width of fovea, posterior margin of fovea weakly rounded at apex, tergites 2-5 sparsely setose, tergites 6-7 densely setose; subgenital plate and ovipositor same as in T. brevicorpis

Female length: 3.5 mm.

Holotype: ♀, India, Andhra Pradesh, Quazipeth, 22.iii.1976 (Cat. No. Tm-2).

Host: Unknown.

Talaeporia indica sp.n.

(Figs. 86, 87, 90, 94, 97, 103)

Male:

Head (Figs. 86-87).- Black, as wide as thorax, wider than long in facial view (1.09 : 0.84), surface rather deeply pitted, interspaces of pits narrow, carinated; eyes densely setose; pre-orbital carinae distinct reaching antennal scrobites, scrobe cavity attaining front ocellus, rugose, delimited by carinae, inter-antennal projection high distinctly projecting; fronto-genal sutures carinate, with distinct carinae, reaching ventral margin of eyes, with two branches below compound eyes, short front one reaching pre orbital carinae, hind one faintly rounding along hind margin of compound eyes as postorbital carinae; height of malar space less than the major axis of eyes; fronto-genital angle widely rounded; ocelli arranged in obtuse angled triangle, basal ocellus removed from occipital margin and from eye nin by less than its own diameter; right mandible tridentate; left bidentate.

Antennae (Fig. 90).- Black, scape less than five times as long as wide (0.75 : 0.15), shorter than pedicel to third funicle segment combined; pedicel wider than long (0.14 : 01); ring segment transverse; funicle segments subquare; club

three segmented, less than two times as long as wide (0.35 : 0.18), longer than preceding funicle segment: 1-7 funicle and club segments with numerous sensoria.

Thorax.- Black, compactly pitted, pits shallow, large, with fine interspaces: pronotum shallowly depressed at middle, anterior carinae distinct on lateral margins, turning faint inwards and obliterated near middle of pronotum: scutellum rather abruptly declined near apex in profile, apex slightly bilobed: propodeum (Fig. 94) flat and wide, declined gently towards apex, with submedian, accessorial and sublateral carinae distinct, median areola deep, lateral costae with teeth like projections: shagreened with silvery white hairs.

Fore wings.- Hyaline, two and a half times as long as wide (2.8 : 1.03), submarginal four times longer than marginal vein (0.99 : 0.25), post marginal one and a half times longer than marginal (0.43 : 0.25), stigmal short (Fig. 97): marginal fringe short.

Hind wings.- Hyaline, nearly four times as long as wide: marginal fringe short.

Fore legs.- Black, except apex of femur and tarsi reddish brown.

Middle legs.- Coloration same as on forelegs.

Hind legs.- Black, coxae and femora minutely, densely punctate, densely pubescent, femora on outer-ventral margin with two weak lobes, a series of ventral dense teeth occupying apical two thirds of ventral margin (Fig. 103).

Abdomen.- Black, shorter than thorax, tergite I occupying slightly less than one-half of gaster, base with short but distinct carinae on eitherside of median fovea, carinae as long as fovea, fovea rounded at apex: posterior margin weakly rounded, dorsal surface with minute puncta, lateral surfaces [illegible]ly setose, tergite II densely setose except a median portion, 3-7 densely setose .

Male length: 4.38 mm.

Holotype: ♂, India, Madhya Pradesh, Bhopal, 23.3.1976. (Cat. No. 0 - I).

Host: Unknown.

Paratypes: ♂ (Data same as for holotype).

PLATE - XIII

(figs. 81 - 87)

81. Teinonia vittata sp.n. : Head (Facial view), ♀

82. T. brevicornis sp.n. : Head (Facial view), ♀

83. T. brevicornis sp.n. : Head (Dorsal view), ♀

84. T. hyalonemia sp.n. : Head (Facial view), ♀

85. T. hyalonemia sp.n. : Head (Dorsal view), ♀

86. T. indica sp.n. : Head (Facial view), ♂

87. T. indica sp.n. : Head (Dorsal view), ♂

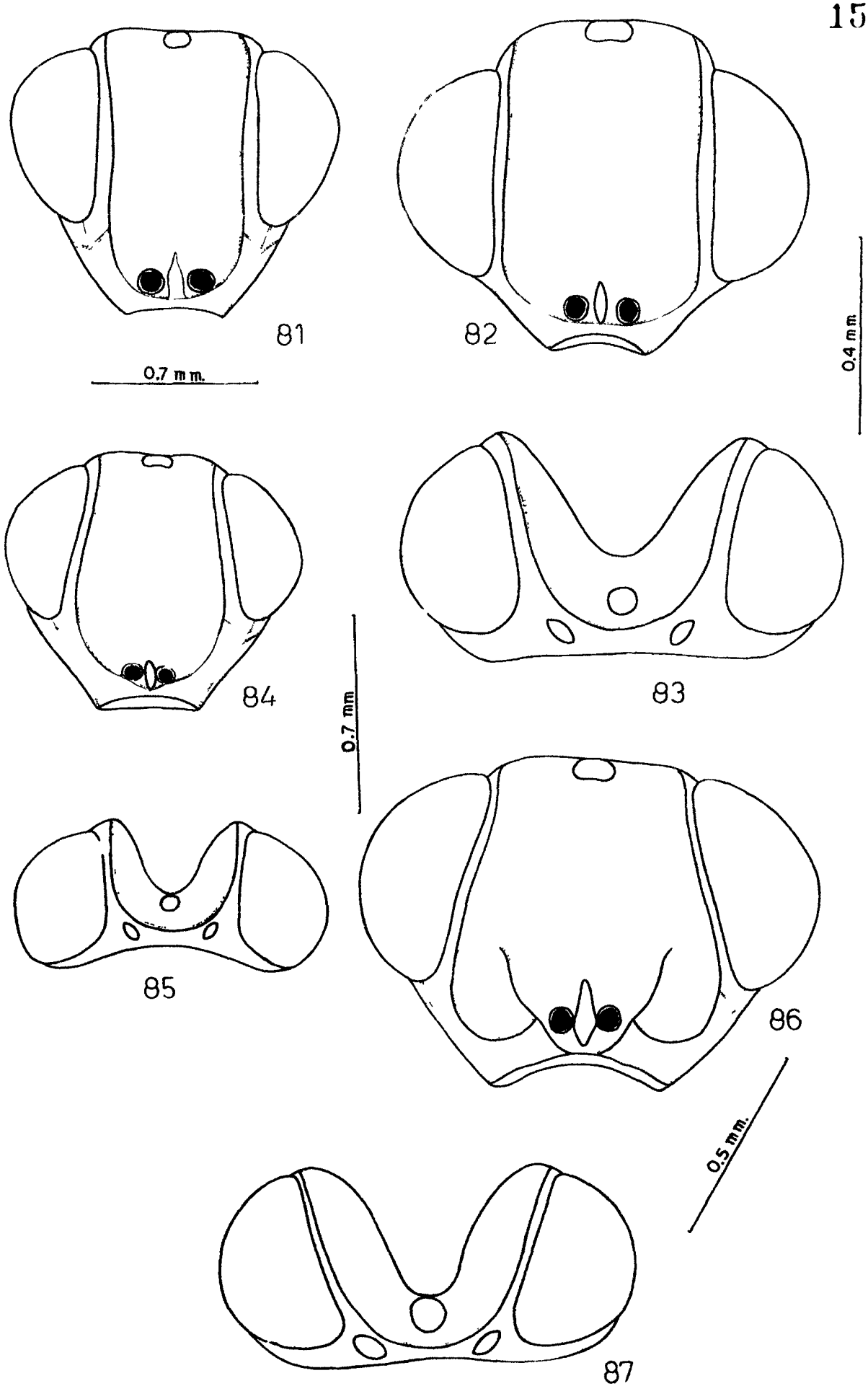

81
0.7 mm.
82
0.4 mm
84
0.7 mm
83
85
86
0.5 mm.
87

PLATE - XIV

(Figs. 88 - 94)

88. Tainania vitata sp.n. : Antenna, ♀

89. T. brevicornis sp.n. : Antenna, ♀

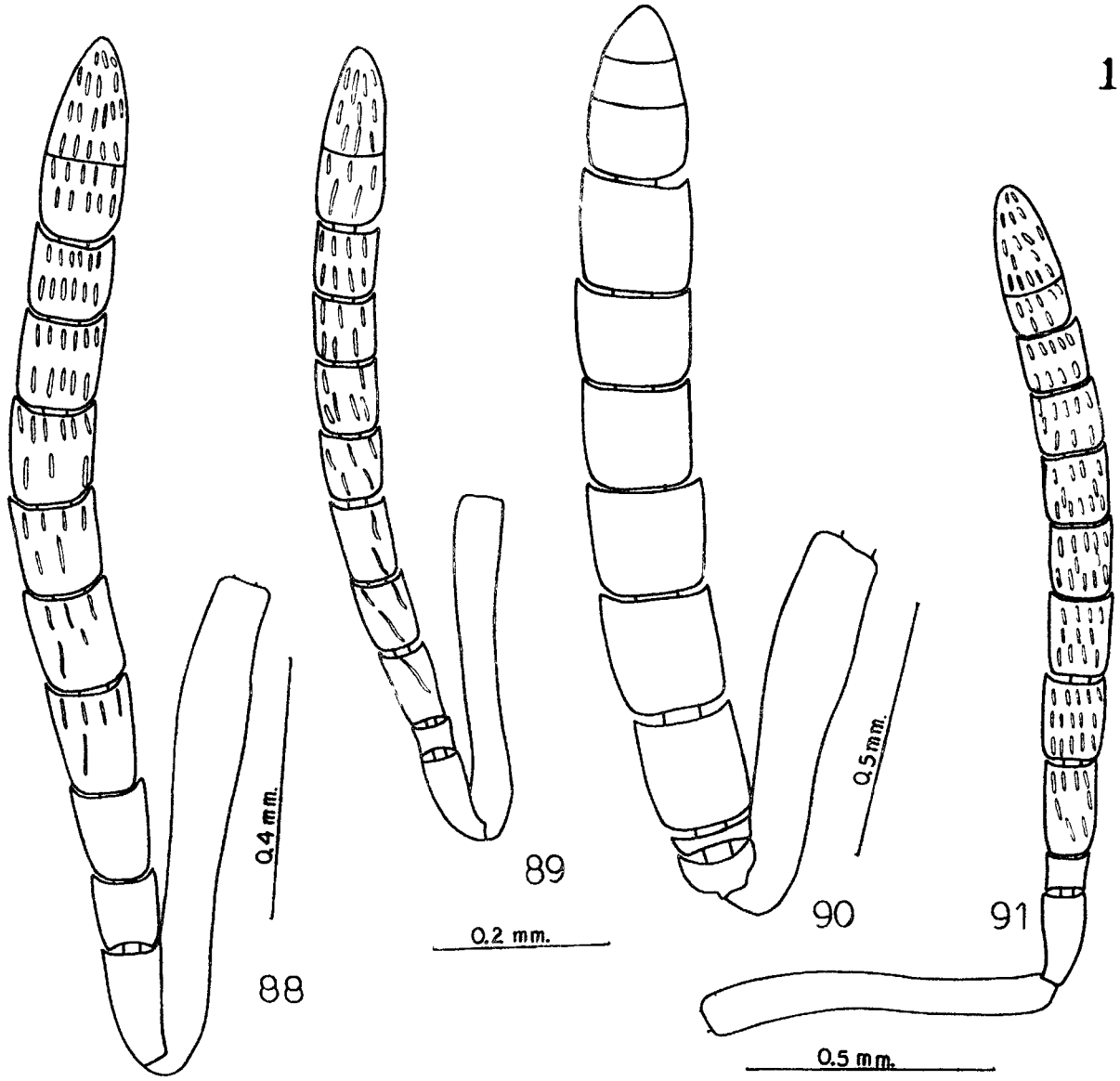
90. T. indica sp.n. : Antenna, ♂

91. T. hyalonervis sp.n. : Antenna, ♀

92. T. vitata sp.n. : Propodeum, ♀

93. T. brevicornis sp.n. : Propodeum, ♀

94. T. indica sp.n. : Propodeum, ♂


0.4 mm.
88
89
0.2 mm.
0.5 mm.
90
91
0.5 mm.

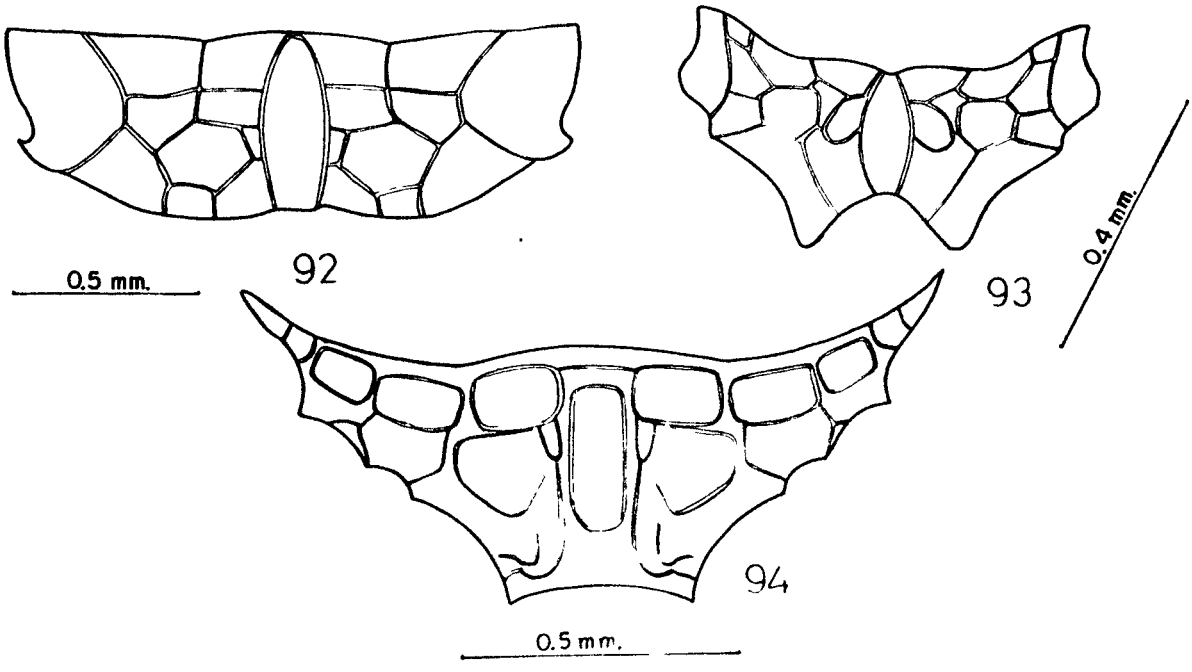

0.5 mm.
92
93
0.4 mm.
94
0.5 mm.

PLATE - XV

(Figs. 95 - 101)

95. Teinenia hyalonemnia sp.n. : Propodeum, ♀

96. T. vitata sp.n. : Forewing, ♀

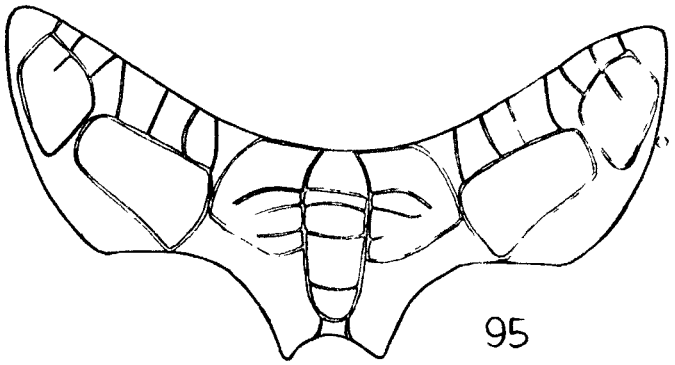
97. T. indica sp.n. : Part of venation of forewing, ♂

98. T. hyalonemnia sp.n. : Part of venation of forewing, ♀

99. T. brevicornis sp.n. : " " " " " ♀

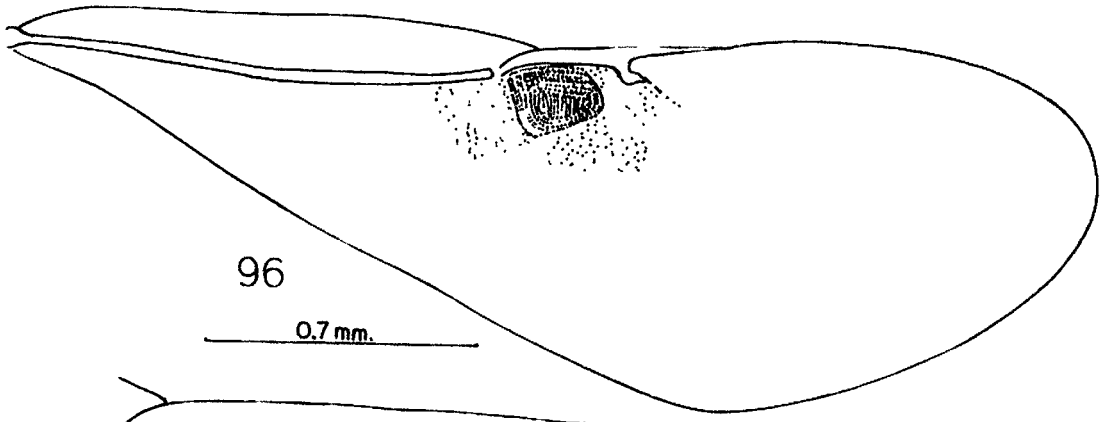
100. T. vitata sp.n. : Hind femur, ♀

101. T. brevicornis sp.n. : Hind femur, ♀



95

0.5mm.

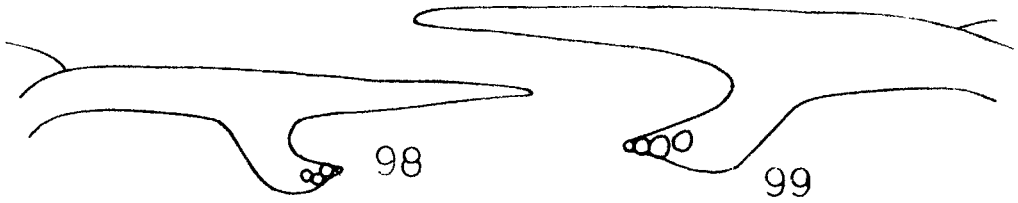


96

0.7 mm.

97

0.3 mm.

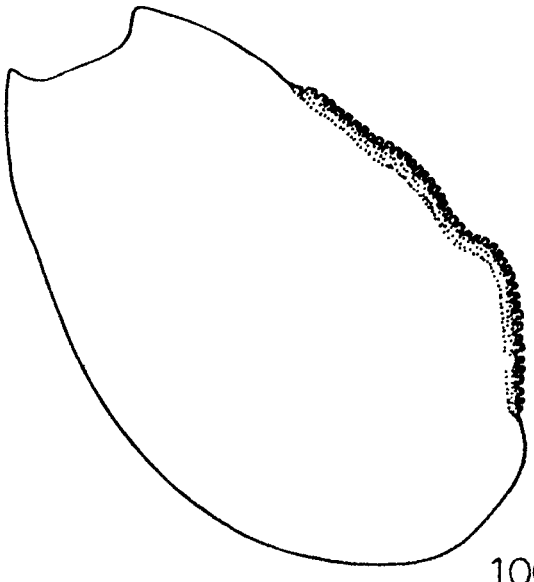


98

99

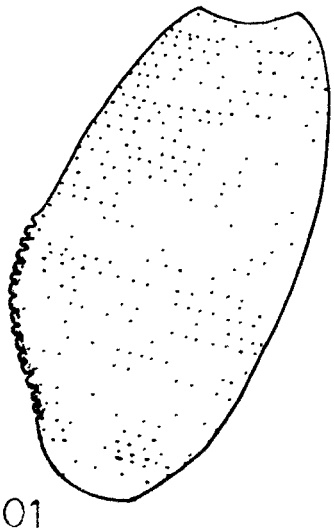
0.2 mm.

0.08 mm.



100

0.5 mm



101

0.3 mm.

PLATE - XVI

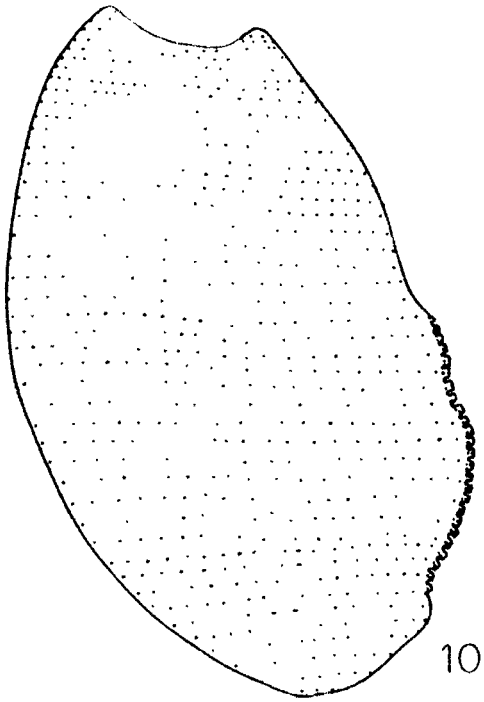
(Figs. 102 - 105)

102. Teinenia hvalonemnis sp.n. : Hind femur, ♀

103. T. indica sp.n. : Hind femur, ♂

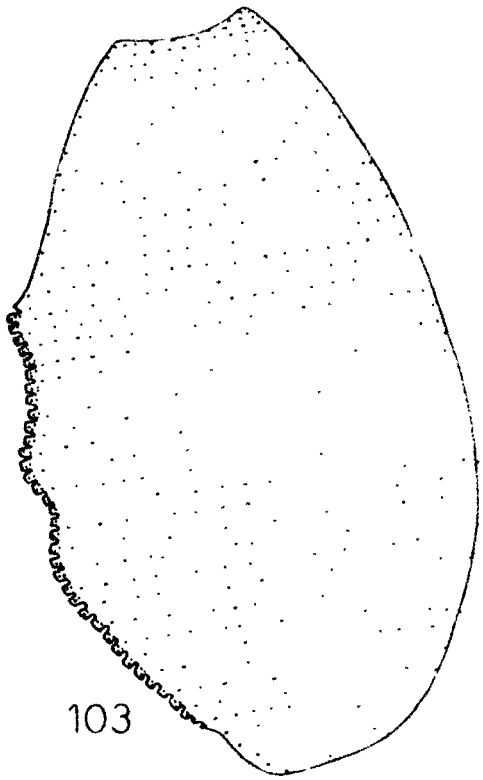
104. T. vitata sp.n. : Subgenital plate

105. T. vitata sp.n. : Ovipositor



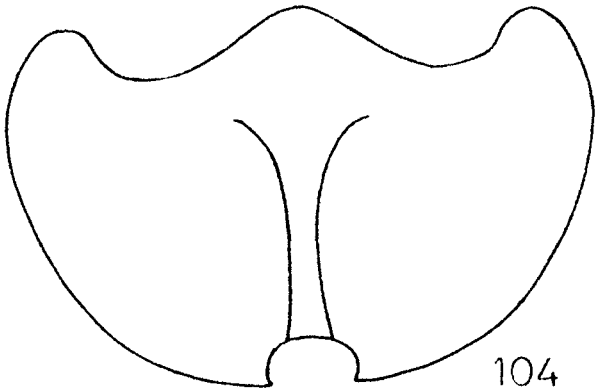
102

0.4 mm.

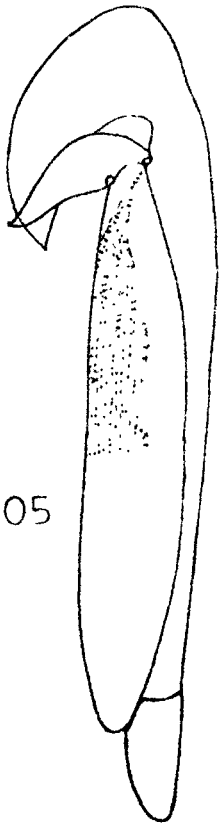


103

0.5 mm.



104



105

0.7 mm.

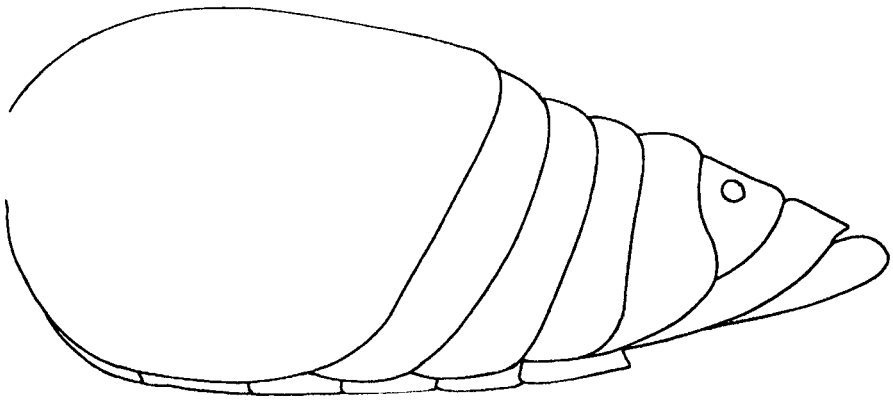
PLATE - XVII

(Figs. 106 - 108)

106. *Taimania vittata* sp.n. : Caster. ♀

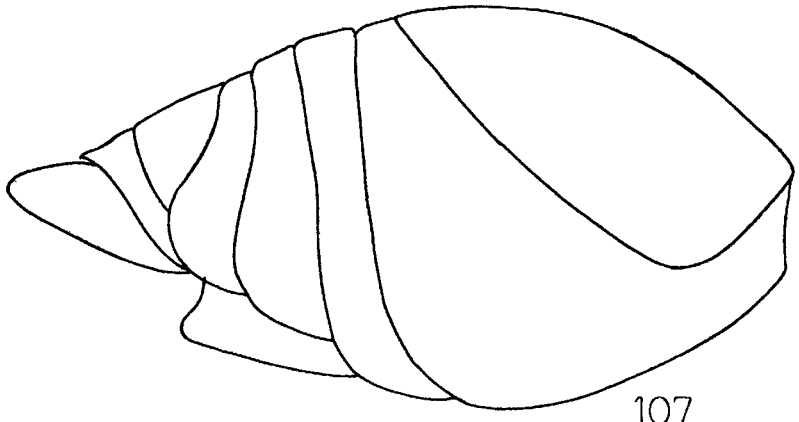
107. *T. brevicornis* sp.n. : Caster. ♀

108. *T. hyalonemia* sp.n. : Caster. ♀



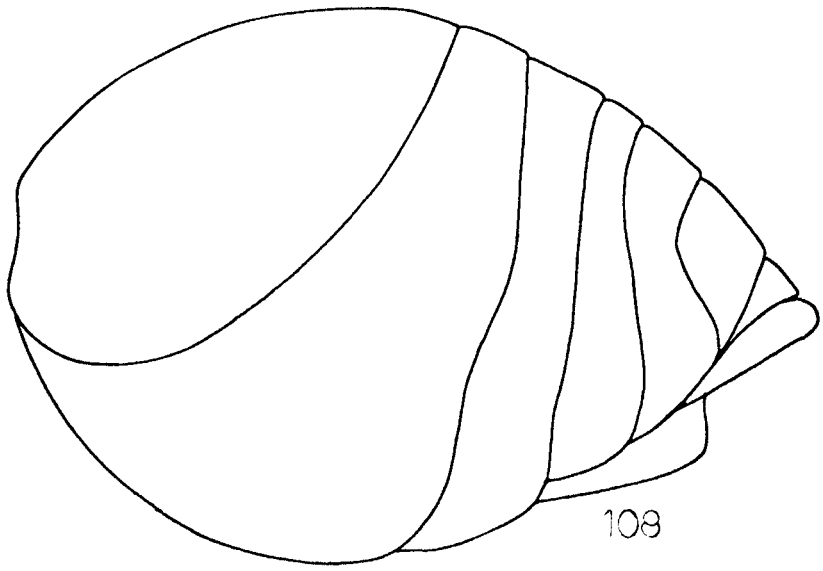
106

1 mm.



107

0.4 mm.



108

0.5 mm.

Tribe Eubothrogini

Marginal vein of forewings a little remote from anterior wing margin and running parallel to it; post marginal vein absent; stigmal vein very short; apical ventral teeth of hind femora projecting on outerside of hind tibiae and basal ventral teeth projecting on innerside when hind tibiae bent.

The genus was described by Masi (1924) and its genotype E. elegantula Masi was designated by Boucek (1951).

Masi (1929) recorded 2 new genera - Euchalcidia and Dromochalcidia. Steffan (1948) added Tranteria and Peltochalcidia as new genera. In 1951, Steffan grouped - Leveria Ms., Lasiochalcidia Ms., Philochalcis Kieffer, Peltochalcidia Steffan, Amblochalcidia Steffan, Euscelis Steffan & Solenochalcidia Steffan under group "Euchalcidia". His illustrated account also contain descriptions of 24 species including 9 new species.

Boucek (1951) described 5 genera and 17 species (4 new) from the European region. Nikolskaya (1952) included 11 genera and 57 species. In 1960(a) she recorded 7 genera including Conhalcochalcidia Nik. and Neobrachythorax Nik. as new genera from USSR. Her studies were consolidated. In 1960(b) she recorded 11 genera and discussed 47 species from the European part of USSR.

Habu (1960, 62) recorded 2 genera and 3 species (2 new ones) from Japan.

Peck et al. (1964) described 4 genera and 11 species from Czechoslovakia.

Farooqi (1976) pointed out the possibility of distinguishing the genus Euchalcidia Ms. from other related genera on the basis of their ♂ and ♀ genitalia.

Nikolskaya in Tryapitsin (1978) listed 6 genera and 15 species from the European part of USSR.

Genus Euchalcidia Masi

Genotype: Euchalcidia elegantula Masi, 1924 (Desig. by Boucek, 1951).

Kieffer, 1899: Ann. Soc. Ent. France, 68: 374.- Masi, 1916: Ann. Mus. Civ. St. Nat. Genova, 47: 112.- Masi, 1927: Mem. Soc. Ent. Ital 6(2): 221.- Masi, 1929: Bull. Lab. Ent. R. Ist. Suppl. Agr. Bologna, I: 173.- Masi, 1929: Ann. Mus. Civ. St. Nat. Genova, 53: 210.- Hanna, 1934: Ann. Mag. Nat. Hist. ser. 10, V, 13: 475.- Steffan, 1951: Mem. Mus. Nat. Hist. Nat. nouv. Ser. (A), Zool. 4(2): 53.-

Boucek, 1951: Acta Ent. Mus. Nat. Pragae, 27 Suppl. 1: 87.- Nikolskaya, 1952: Opred Faune CCCP, 44: 101.- Nikolskaya,(1969(a): Trud. Zool. Ins. Acad. Nauk. SSSR, 27: 234.- Nikolskaya,1969(b): Zool. Ins. Acad. Nauk, SSSR, no. 76: 186 .- Habu, 1960: Bull. Nat. Inst. Agr. Sci., Ser. c. no. 11: 283.- Habu, 1961: Kontyu, 29: 169.- Habu, 1962: Fauna Japonica: 117.- Peck et al. 1964: Mem. Ent. Soc. Canad.: 15.- Steffan, 1967: Bull. Soc. Ent. France, 31(1-2): 52.- Habu, 1976: Mushi, 49(2): 19.- Farooqi, 1976: Orient Ins. 10(3): 410.- Nikolskaya, 1978: Opred. Faune CCCP, no. 120: 56.

Genus Euhaloidia Masi is characterised by having 11-segmented antennae, with long annellus, inserted near edge of mouth; right mandible 3-dentate, left 2-dentate; scutellum rounded at aped; hind femur with 2 triangular protrusions - a sharp anterior and a blunt posterior; first tergite with 2 carinae near base.

Species are mainly parasitic on Lepidoptera and Coleoptera. But records of their parasitising some Diptera and Hymenoptera are also available (Habu, 1962).

Key to species of the genus Euchalcidia Masi

1. Propodeum with sub median carinae 2

— Propodeum without sub median carinae..... E. barbara Masi and E. philliniensis Ms.

2. Club 2 or 3 segmented 3

— Club unsegmented 5

3. Club 3segmented, ... 4

— Club 2-segmented; scrobe cavity not reaching front ocellus; scape as long as 2-5 antennal segments combined; lateral costae of propodeum with small faint tooth behind spiracles, latero-posterior teeth indistinct -.....E. ishii Habu,♂

4. Funicle 4-7 segments as long as wide, club as long as annellus and following two funicle segments combined..... .....E. armaticornis Masi

— Funicle segments longer than wide; club as long as annellus and first funicle segment combined ....E.orientalis sp.n.

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* Comparison of type species not done.

5. Antennae and legs black on most part 6

— Antennae and legs reddish 8

6. Tergite II punctate on mesos 7

— Tergite II glabrous on mesos, tergite I with carinae on basal one-fifth of its length..... *E. kazimurai* Habu

7. Scape as long as 2-4 antennal segments united, pedicel globose, club longer than annellus.....
..... *E. technivora* Steffan

— Scape longer than 2-5 antennal segments united, pedicel distinctly longer than wide, club as long as annellus; tergite II strongly emarginate at apex. *E. sanna* (Fabr.)*

8. First funicle segment not more than twice as long as wide.....9

— First funicle segment more than twice as long as wide, vertex between hind ocelli curved; propodeum without clear teeth with narrow median cell..... *E. amandata* Mik.

9. Tergite I punctate 10

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* = *Chalcis sanna* Fabr., 1793 = *Chalcis sarcinae* Perez., 1832 = *Hockeria nigrinae* Walker, 1834 = *Haltichella sexdentata* Foerster, 1895 = *Smohalcis nakulana* Kasi, 1916.

— Tergite I and II glabrous; scape (♂) deeply grooved at apex..... *E. blanda* Nik.

10. Tergite I with smooth hind margin 11

— Tergite I densely punctate; propodeum without tooth; scape (♂) deeply grooved at apex..... *E. mandibularis* Nik.

11. Club as long as annellus and first funicle segment combined 12

— Club distinctly shorter than annellus and first funicle segment combined 14

12. 7th funicle segment twice as long as wide 13

— 7th funicle segment one and one-half times as long as wide; scape as long as 2-6 antennal segments combined.... .....*E. asikae* Nik.

13. Part of fore and mid femora darkened; antennae slender... .....*E. micromatricida* Steffan

— Fore and middle legs entirely red; antennae more slender..... *E. subflavescens* Steffan

14. Fronto-genal sutures more or less visible; scape as long as 2-3 antennal segments combined.....*E. gennadiusi* Hanna

— Fronto-genal sutures invisible; scape as long as 2-6 antennal segments combined..... *E. tokyoensis* Habu

Euchalcis orientalis sp.n.

(Figs. 109-116).

Female:

Head (Fig. 109).- Black, ocelli eyes and maxillar yellowish mandibles reddish brown at apex, black at base, wider than long in facial view (0.79 : 0.52), surface densely pitted, shagreened with silvery white hairs; pre and post orbital carinae absent; scrobe cavity rather shallow, not reaching front ocellus; inter-antennal projection rather wide, protuberant; fronto-genal sutures not carinated, malar spaces shorter than the longitudinal diameter of eyes (0.27 : 0.29); ocelli in obtuse angled triangle, basal ocellus removed from eye rim by less than its own diameter and from occipital margin by about three times its diameter; maxillary palpi 4-segmented, labial palpi 3-segmented, left mandible tridentate, right bidentate (Fig. 110).

Antennae (Fig. 111).- Black except at base of scape bearing reddish brown tinge; scape cylindrical, narrow, dilated at base, less than eight times as long as wide, (0.62 : 0.08), as long as pedicel to half of 4th funicle segment combined; pedicel about four times as long as wide (0.23 : 0.06), as long as preceding two funicle segments combined; funicle segments longer than wide; club 3-segmented

more than three times as long as wide (0.2 : 0.06), longer than preceding 2 funicle segments combined;

Thorax.- Black, tegulae reddish brown, pits on dorsum relatively shallow and small, on pronotum more dense, on scutellum large and more spaced; microsculptures present; scutellum gently declined posteriorly, rounded at apex; propodeum (Fig. 112) almost flat, abruptly declined at apex, with distinct submedian and sub-lateral carinae.

Fore wings.- Faintly smoky, sparsely ciliated, two and one-half times as long as wide (1.8 : 0.7) marginal vein slightly remote from anterior margin, one-fourth as long as submarginal vein, stigmal vein one-fourth of marginal vein, post marginal vein very small (Fig. 113).

Hind wings.- Hyaline, about three and one-half times as long as wide; marginal fringe short.

Fore legs.- Reddish brown with blackish tinge on femur, claws dark.

Middle legs.- Coloration same as on fore legs.

Hind legs (Fig. 114).- Black with dorsal margin of tibiae reddish brown; outer surface of coxae, and femora shallowly pitted, covered with silvery white hairs, outer

PLATE - XVIII

Encheleidia orientalis sp.n., ♀
(Figs. 109 - 117)

109. Head (Facial view)

110. Mandibles

111. Antenna

112. Propodeum

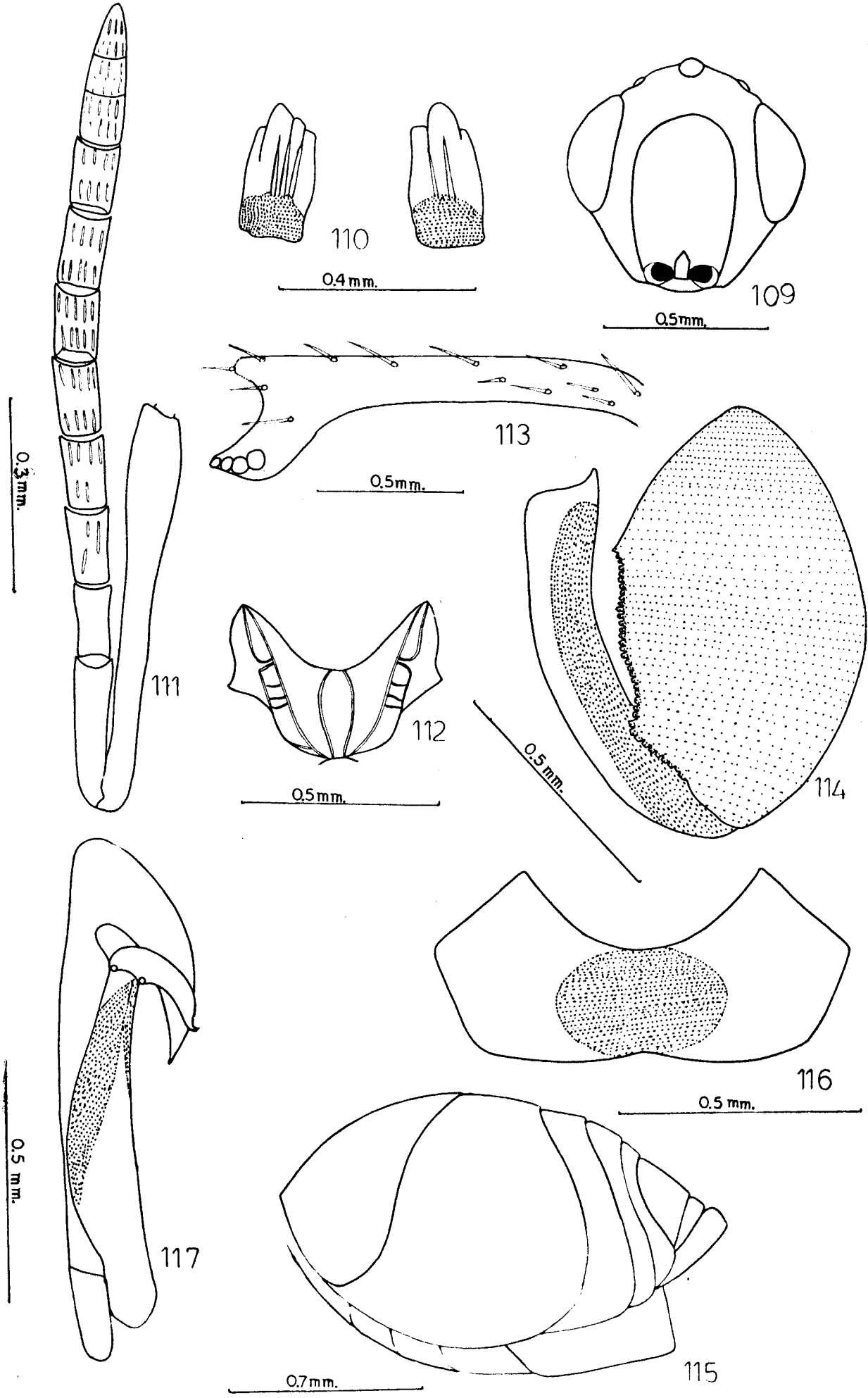
113. Part of venation of forewing

114. Hind femur and tibia

115. Gaster

116. Subgenital plate

117. Ovipositor


110
0.4 mm.
109
0.5mm.
113
0.5mm.
0.3mm.
111
112
0.5mm.
0.5mm.
114
116
0.5 mm.
0.5 mm.
117
0.7mm.
115

ventral margin with one triangular projection before base and one rounded lobe before apex,with numerous truncated dense teeth from basal projection to beyond apical lobe.

Gaster (Fig. 115).- Black, accuminate at apex, shorter than thorax; tergite I occupying basal one-fourth of gaster with two median carinae almost glabrous; tergite II on dorsal surface impunctate, posterior margin deeply emarginate, posterior margin with a slight concavity (Fig. 116); ovipositor concealed (Fig. 117); outerplates of ovipositor black and rounded at apex, base truncated with a thick muscular ridge on ventral margin and a thin muscular ridge on dorsal margin; first valvifers with apical and basal angled at the same level, second valvifers long, narrow near middle, third valvulae black at apex, movably articulated with second valvifers.

Female length: 2.4 mm.

Holotype: ♀, India, Uttar Pradesh, Aligarh, ex. Brachmia hibiani Stn., on Abelmoschus esculentus (L.) Moench, 6.vi.1976.

Paratypes: 10 ♀ (Data same as for holotype).

Subfamily Dirhininae

Dorsal part of frons prolonged forward as two horns, scrobe cavity deeply excavated between horns; antennae inserted usually a little below level of ventral margin of compound eyes, just below clypeus; hind tibiae prolonged apically and pointed, without spur; petiole short but clearly visible.

Burks (1936) in the course of his studies of Nearctic fauna of the tribe Dirhinini synonymized Emmaa Kirby, 1883; Hontalia Cameron, 1884 and Paramiaca Carwford, 1913with the genus Dirhinus Dalman, 1818. Hontalia Cameron was earlier misplaced in the tribe Aximini of family Pteromalidae. Burks (1947) added the descriptions of 4 species including 2 new ones. Masi (1947) treated Dirhinus, Paramiaca, Hontalia, Dirhinoidea and Pseudemiaca as separate and valid genera Besides key to genera he also gave a comprehensive key to the species of Hontalia and Paramiaca. Boucek (1951) supported the synonymy of the genus Emmaa Kirby with Dirhinus Dalman based on description of species by Masi (1947). Nikolskaya (1952) described 3 species (2 new) under the genus Dirhinus. In (1960a) she treated Dirhinus and Dirhinoidea as distinct genera and also recorded 6 species. Habu (1950, 62) devided the subfamily into 2 tribes viz., Aplorhinini and Dirhinini.

The former consists of only Aplorhinus bakeri Masi, which occupies an intermediate position between Dirhininae and Epitraninae. To the list of synonymies suggested by Burke (1956) he added Dirhinoides, Girault, 1912 and Entacella Girault, 1913. Habu proposed 3 subgenera - Dirhinus Dalman Dirhinoides Masi and Hontalia Cameron and described 5 species from Japan. Peck (1963) supported the synonymy proposed by Habu. Peck et al. (1964) listed a single species from Czechoslovakia.

Mani and Dubey (1972,74) considered Paraniaca, Dirhinus as distinct genera. In all they described 5 new species and recorded an old one from India.

Boucek (1974) added a new genus Youngsia.

Farrooqi (1976) suggested use of male and female genital components for separating 3 species of Dirhinus and 3 species of Dirhinoides.

Nikolskaya (1978) in Tryapitsin - Fauna of European part of the USSR mentioned a single species. Burks (1979) catalogue records synonymies proposed by Habu (1962) and Peck (1963) and listed one genus and three species from America North of Mexico.

Tribe Dirhinini

Horns of head long; scutellum not prolonged at apex; forewings with long marginal vein; abdomen in female more or less pointed at apex; tergite I with some longitudinal carinae at base.

Genus Dirhinus Dalman, 1818

Genotype: Dirhinus excavatus Dalman, 1818:

Dalman, 1818: Svensk. Vet. Akad. Handl. 39: 75.- Dalman, 1823: Analecta Ent.: 29.- Nees, 1834: Hymenopterorum Ichneumonitus affinium Monogr. 2: 56.- Foerster, 1856: Hymenopterologische Studein, 2: 29.- Giraud, 1863: Verh. Zool. bot. Ges. 13: 1312.- Walker, 1871: Notes on chalcididae 3: 39.- Ashmead, 1888: Ent. Amer. 4: 67.- Ashmead 1896: Trans. Amer. Ent. Soc. 23: 217.- Dalla Torre, 1898: Cat. Hym.: 367.- Ashmead, 1904: Mem. Carnegie Mus. 1: 357.- Schmiedeknecht, 1909, Gen. Ins., fasc. 97: 67.- Silvestri, 1913: Boll. Lab. Zool. Portici, 8: 131.- Masi, 1918: Ann. Mus. Civ. Stor. Nat. Genova, 51: 144.- Rohwer, 1923: Philipp. Journ. Sci. Manila, 22: 345.- Masi, 1924: Ann. Mus. Civ. Stor. Nat. Genova,

5: 144.- Mani, 1927: Zoo, 3(1): 129.- Burks, 1936: Proc. Nat. Acad. Sci. 22: 285.- Mani, 1943: Boll. Soc. ent. It. 74: 132.- Schmitz, 1946: Inst. Parcs. Nat. Congo Belge, 48: 169.- Mani, 1947: Zoo, 25: 39.- Burks, 1947: Proc. ent. Soc. Wash. 49: 136.- Boucek, 1951: Acta Ent. Mus. Nat. Pragae, 22, no. 308: 34.- Nikolskaya, 1952: Opred Fauna CCCP: 83. Nikolskaya, 1960(a): Akad. Nauk. CCCP, 27: 220.- Nikolskaya, (1960(b): Zool. Akad. Nauk CCCP, no. 76, VII: 51.- Erdos, 1955: Fauna Hung.: 16.- Habu, 1960: Bull. Nat. Inst. Agr. Sci.: 307.- Habu, 1962: Fauna Japonica: 136.- Peck, 1963: Cat. Nearct. Chalc.: 864.- Kerrich, 1964: Rev. Zool. Bot. Afr. Brussels, 70: 113.- Peck, et al. 1964: Key Chalcid. Czech. no. 34: 12.- Mani, 1972: Orient. Ins. 6(3): 401.- Mani, 1974: Mem. Soh. Ent., St. John's college, Agra, no. 3: 29.- Farooqi, 1976: Orient. Ins. 10(3): 394.- Nikolskaya, 1978: Opred Fauna CCCP, no. 120, III: 45.- Burks, 1979: Cat. Hym. Amer. No. Mexico, 1: 864.

Synonymy:

Dirhinus Dalman, 1818: Svenska Vetensk. Akad. Handl. 39: 75.

Genotype: Dirhinus ex^ gavratus Dalman (monotypic).

Eniasa Kirby, 1883: Journ. Linn. Soc. Lond., Zool. 17: 54.
Genotype: Chalcis carmigera Jurine (Orig. Desig.)

Hontalia Cameron, 1884: Biol. Cent.-Am., Hym. I: 112.
Genotype: Hontalia scarulea Cameron.

Chontalia Schulz, 1906: Spolia Hym.: 149.

Dirhinoidea Girault, 1912: Arch. Naturg. Jahrg. 78A(6): 165.
Genotype: Dirhinoidea maculata Girault. (Orig. Desig.)

Eniasella Girault, 1913: Bull. Wisc. Nat. Hist. Soc. 11: 35.
Genotype: Eniasella rufiscrnis Girault (Orig. Desig.)

Paraniasa Crawford, 1913: Proc. U.S. Nat. Mus. 45: 312.
Genotype: Paraniasa schwarzi Crawford (Orig. Desig.)

Paraniasa, Mani et al. 1972: Orient. Ins. 6(3): 401.

Dirhinoidea, Mani et al. 1972: Orient. Ins. 6(3): 501.

Dirhinus, Mani et al. 1972: Orient. Ins. 7(3): 404.

Dalman (1818) described D. excavatus as genotype for the genus Dirhinus with 12-segmented antennae, inserted moderately far from the margin of clypeus and having the head deeply excavated nasally. Mani (1919) however, pointed out that the number of antennal segments is actually 13, the usual number in the chalcidinae. Kirby (1883) described genus Eniasa as having 13-segmented antennae besides it does not show any significant difference from Dirhinus. Cameron

(1884) originallly placed the genus Hantalia in the tribe Arimini of the family Pteromalidae. It differs from Dirhinus and Aniasa only in that the frons is secondarily produced to form two smaller projections below the principal ones of the vertex and the female possesses a long, conspicuously - exserted ovipositor. Paraniasa crawford was set up on the same character as used for Hantalia the possession of secondary protuberance on the frons.

Genus Dirhinus can be distinguished from other genera by the following combination of Characters:

Head produced anteriorly on either side of scrobe cavity into two horn like processes: fronto-clypeal suture absent, antennae 13-segmented inserted at middle of frons, club distinctly 3-segmented; forewings with marginal vein more or less spaced from sub marginal; hind femora with a basal teeth on outer-ventral margin, from this teeth follow a series of fine dense teeth until before apex; petiole with 4 or 6 carinae.

Habu (1960) devided the genus Dirhinus into three subgenera: Hantalia Cameron, Dirhinoidea Masi and Dirhinus Dalman.

Key to subgenera of *Dirhinus* Dalman

1. Frons without tooth on lateral margins of scrobe cavity.....2

-- Frons with secondary tooth below apex of horns on lateral margins of scrobe cavity; frons with one sharp tooth at apex..... *Kontalia* Cameron

2. Horns rounded at apex..... *Dirhinoidea* Masi

-- Horns with 2 teeth at apex..... *Dirhinus* Dalman

Subgenus *Hentalia* Cameron

Genotype: *Hentalia granulosa* Cameron (Orig.Desig.)

Hentalia Cameron: 1884: Biol. Centr.-Amer. Pt. 31, Hym.1: 112.

Dirhinus Ashmead, 1896: Trans. Amer. Ent. Soc. 23: 217.

Chentalia Schulz, 1906: Spolia Hym.: 149 (emandation).

Parauisaca Crawford, 1913: Proc. Nat. Mus. 45: 312.

Genotype: *Parauisaca schwarzi* Crawford (Orig.Desig.)

Dirhinus Silvestri, 1913: Boll. Lab. Zool. Portici, 8: 131.

Dirhinus Waterston, 1917: Bull. Ent. Res. VIII: 178.

Parauisaca Mani, 1947: Sci., 23: 65.

Parauisaca Mani & Dubey, 1972: Orient. Ins. 6(3): 401.

Parauisaca Mani & Dubey, 1974: Mem. Sch. Ent., St. John's College Agra, No. 3: 30.

Horns with one sharp tooth at apex: frons with one more or less sharp tooth below apex of horns on lateral margins of scrobe cavity; pits on head and thorax compact: tergite I generally with some longitudinal carinae at basal area on dorsal side (In *Altisornia* Mani and *linearia* Mani) tergite I is not carinate).

Mani & Dubey (1972, 74) recorded some species of Hantalia from India under Paramiasa Crawford.

Masi (1940) key to species has been revised keeping in view the recent synonymies.

Key to species of subgenus Hantalia Cameron (after Masi, 1940).

1. Species with a furrowed (sulcate) area at the base of gaster; epiorbital horns with non crenulate margins.....2

— Species without a sulcate area at the base of gaster; epiorbital horns with more or less crenulate margins; petiole also in female longer than wide.....12

2. Sculate area quadrangular or pentagonal 3

— Sulcate area a little epiptical, about two-third of tergite I; Madagascar.....D. (H.) madagascariensis (Masi)

3. Forewings obscure (dark) 4

— Forewings yellowish or faded color..... 6

4. Funicle brown; African species..... 5

— Antennae reddish; tergite I with 6-7 furrows; Neotropical species, Guatamala...D. (H.) rufricornis (Crawford)

5. Head in profile short, with eyes large, length of genaes about two-third of the major axis of eyes; tergite I with 8-9 furrows; scape, pedicel and apex of club reddish..... D. (H.) arborni(Silvestri)

— Head in profile less wide, length of genae almost same as major axis of eyes; antennae lighter towards the apex; parasite of Glossina. .... D. (H.) inflexa (Waterston)

6. Eyes glabrous or nearly so 7

— Eyes densely setose; antennae dark; fore and middle femora and large part of tibiae black; clypeal striations transverse; Phillippines, India. .... D. (H.) trichophthalma (Masi)

7. Tergite I with 8-11 furrows 8

— Tergite I with 4-5 furrows extending to one-fourth of the tergite I; antennae with flagellum dark, annellum hardly as long as wide; tergite I with furrows not hardly as long as peduncle; provided with punctations in basal margin; Panama..... D. (H.) buski (Crawford

8. Tergite I with minutely punctate area towards distal margin; species very big 4-5 mm.....9

— Tergite I without a punctate area on distal margin; spacies small 2-3 mm..... 10

9. Petiole transverse, length of furrows of tergite I about 3 times aof peduncle; these extending to the apex of tergite; head wider in profile, horns much lower, shorter in the upper area; antennae, tegulae, fore and middle legs wexcept coxae reddish; Texas, Arizona, California.....D. (H.) schwarzi (Crawford)

— Petiole of abdomen a little longer than wide; length of furrows of teriite I nearly as long as petiole, these extending to one-fourty of tergite I..... ..... D. (H.) Kirbyi(Ashmead)

10. Furrows of gaster shorter than one-half length of tergite I 11

— Length of middle furrows of gaster about twice that of the outer one, fine and reaching upto the apex of tergite I; antennae, fore and middle legs reddish; New Guinea .....D. (H.) lorica (Masi)

11. Furrows of gaster about one-fourth of tergite; antennae, fore and middle legs dark; Uganda..... .....D. (H.) ugandensis (Masi)

-- Furrows of gaster about one-third of termite I; antennae fore and middle legs ferruginous-brown; India.....D. (H.) coromandelica (Mani & Dubey)

12. Body less slim; epiorbital horns high in lateral view, height not less than three-fourth of vertical diameter of orbits; antennae black, scape except at base more or less tending to yellow, club in male shorter, broader and rounded; Philipines..... ..... D. (H.) aliicornis (Masi)

-- Body linear, epiorbital horns in profile high, height nearabout vertical diameter of eyes; antennae testaceous red, club in male conico-ovate and not wider than the preceding funicle, as long as preceding two segments combined; Philippines....D. (H.) linearis (Masi)

Dirhinus (Hentalia) trichonhthalmus (Masi) Haim
(Figs. 118 - 125)

Paraniasa trichonthalma Masi, 1927: Eos, 3: 39.41.- Masi 1947: Eos, 23: 66.

Dirhinus (Hentalia) trichonhthalmus Haim, 1960 : Bull. Nat. Agr. Sci., Ser. C, no. 11: 310, 328-333.

Paraniasa trichonhthalma Masi, Mani & Dubey, 1972: Orient Ins. 6(3): 401.

Female:

Head (Figs. 118-120).- Black, slightly wider than long, surface compactly pitted, pits somewhat deep, interspaces of pits fairly carinate, with microsculpture; horns gently diverging apically, one-third as long as head length, three-fourth as long as compound eyes, more than twice as long as wide, strongly diverging at apex; apical sharp tooth projecting in fronto-outer direction, outer margin almost parallel, reaching at level of anterior margin of front ocellus; ocellar area raised, without carinae along outer margin of basal ocelli; tooth at base of horns small, at base of horns rather sharp, not large, projection near antennal socket distinct, furrow along hind margin of gena-temporal region somewhat deep, narrow. Head in ventral aspect rather wide, compound eyes densely ciliate; inter-ocellar area without pre-orbital carinae; antennal sockets placed a little below level of ventral margin of compound eyes; ventral margin of scrobe cavity well carinate; malar space almost as long as major axis of compound eyes.

Antennae (Fig. 121).- Black, scape more than six times as long as wide (0.62 : 0.10), as long as pedicel to 4th funicle segment combined; pedicel twice as long as wide

(0.14 : 0.07): annellus subsquare; first funicle longer than wide, segments 2-3 as long as wide, 4-7 wider than long; club less than two times as long as wide (0.22 : 0.12), as long as preceding two and one-half funicle segments combined, second funicle to last club segment with few sensoria.

Thorax.- Black, with compact, large pits on dorsum, pits somewhat confluent in part, scutellum with unpitted space at middle; interspaces of pits fairly carinate, scutellum rounded at apex; propodeum wide, median carina in median areola faint; median carina behind median areola short, fine, submedian carinae distinct, accessorial carinae fine and weak, sub lateral carinae distinct, median areola nearly round, with a few faint secondary carinae, lateral costae with 3 teeth (Fig. 122).

Fore wings.- Smoky, less than three times as long as wide (2.03 : 0.79), cilia on wings almost invisible, submarginal as long as marginal (0.64), post marginal reduced, stigmal very short (Fig. 123); marginal fringes absent.

Hind wings.- Hyaline, about three and a half times as long as wide, marginal fringes short.

Fore legs.- Coxae, on one-third subbasal and tibiae on one-half subapically dark, rest part of legs reddish brown.

Middle legs.- Coloration same as on the fore legs.

Hind legs .- Black except tarsi being yellow, coxae rugose on dorsal surface, punctate and pubescent on ventral surface, femora minutely sparsely punctate on outerside, innerside more sparsely punctate, outer-ventral margin with a series of small teeth.

Petiole.- Black, about one and a half times as long as wide, with 4 longitudinal carinae.

Abdomen.- Black, tergite I occupying two-thirds of gaster, dorsal surface completely smooth, lateral surfaces minutely, densely punctate on posterior area, basal area with distinct carinae; subgenital plate (Fig. 124) somewhat dark in the middle with two lateral lobes and convex in the middle on anterior margin, posterior margin with two rounded lobes, with a deep notch in the middle; ovipositor concealed (Fig. 125) outerplates of ovipositor dark on apical half, broad near middle, truncated at base, somewhat rounded at apex; first valvifers with apical and basal angles at different levels, second valvifers long, narrow near middle, third valvulae long, about one-third of second valvifer, movably articulated to it.

PLATE - XIX

(Figs. 118 - 125)

Dixhinus (*Hentelia*) *trichophthalmus* (Hael), Babu, 1962, ♀

118. Head (Dorsal view)

119. Head (Ventral view)

120. Head (Lateral view)

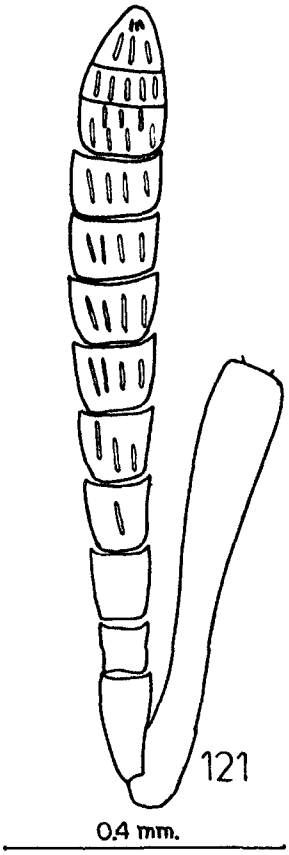
121. Antenna

122. Propodeum

123. Part of venation of forewing

124. Subgenital plate

125. Ovipositor.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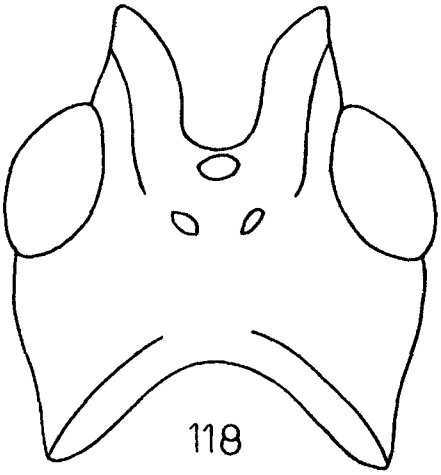
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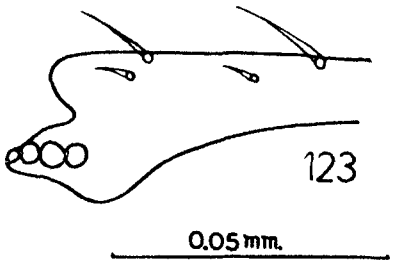
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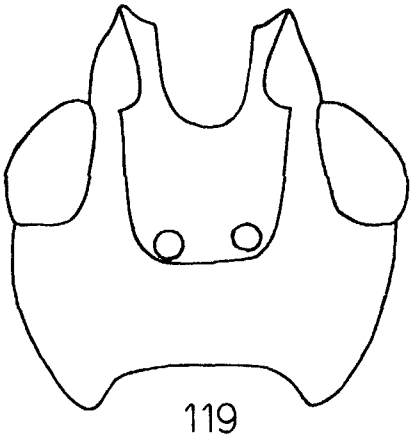
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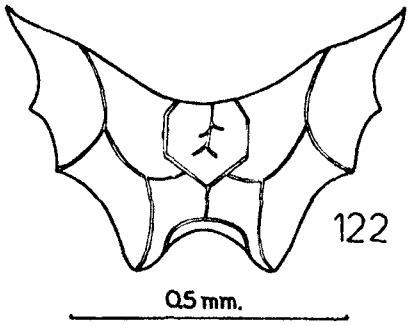
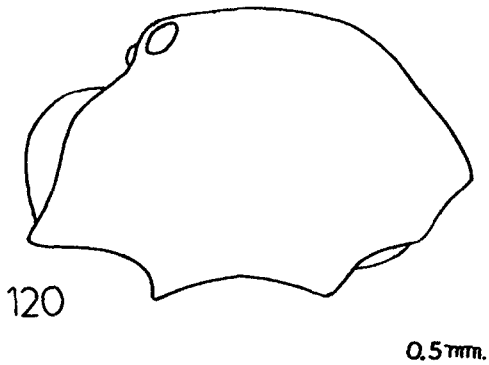
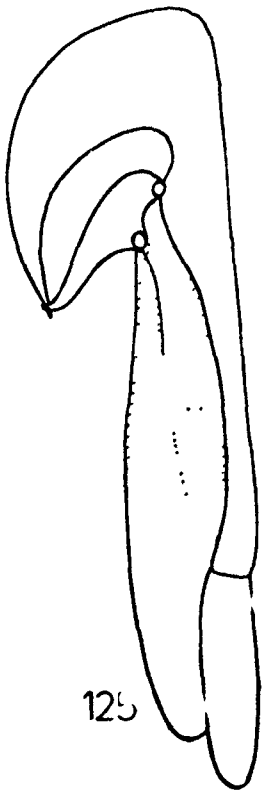
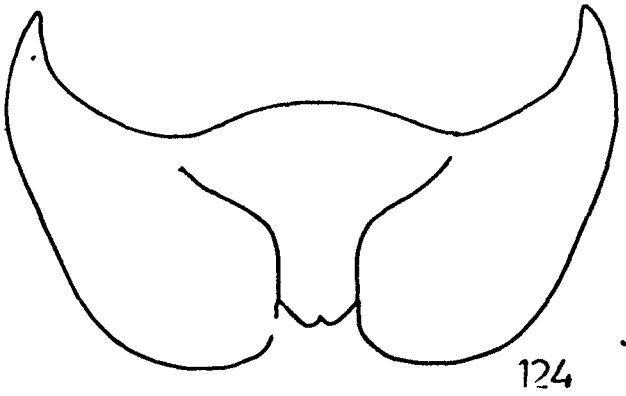

122
0.5 mm.


120
0.5 mm.


125


124
0.4 mm.

Female length 3.1 mm.

Holotype: ♀, India, Uttar Pradesh, Aligarh, 10.viii.1977. (Cat. No. D-2).

Host: Unknown

Paratypes: 25 ♀♀, (Data same as for holotype).

Subgenus : Dirhinoidea Masi

Genotype: Dirhinus mashunarna Masi (Orig.Desig.)

Dirhinoidea Masi, 1947: Soc. 23: 49.

Dirhinoidea Habu, 1962: Fauna Japonica: 139.

Dirhinoidea Mani & Dubey, 1972: Orient. Ins. 7(3): 401.

Horns rounded at apex; frons without tooth below apex of horns on lateral margins of scrobe cavity; pits on surface of head and thorax partly more or less sparse; tergite I with longitudinal carinae at basal area on dorsal side.

Key to species of the subgenus Dirhinoidea Masi

1. Outer surface of hieria (horn) almost reaching margin of compound eyes; females 2

— Outer border of hieria away from the margin of compound eyes, median carina continued beyond median areola to the posterior margin of propodeum.....
.....D. (D.) lakhimpuraensis, ♂, sp.n.

2. Horns seen from dorsal side broad and nearly uniformly rounded.....3.

— Horns seen from dorsal side obliquely truncated at apex; epistoma with fine transverse striations; labrum opaque... .... D. (D.) *neshamerus* (Mani)

3. Median areola of propodeum short, not reaching to posterior margin of propodeum, post median carina distinct.....4

— Median areola itself meets the posterior margin of propodeum, postmedian carina indistinct.....5

4. Median carina of propodeum distinct, continued to meet the posterior margin of propodeum. ....D. (D.) *mathuri* (Mani & Dubey)

— Median carina of propodeum indistinct..... .....D. (D.) *lunonemia* (Rohrer)

5. Antennae with funicle segments strongly thickened, last funicle segment more than twice, wider than long; propodeum with large cell, with longitudinal and transverse carinae.....D. (D.) *wahlfahrtiae* (Ferriere)

— Antennae with funicle segments less strongly thickened, last funicle segment not more than twice wider than long; propodeum with small cell, with indistinct median carina..... D. (D.) vlassovi (Nikol'skaya)

Dirhinus (Dirhinoidea) luzonensis Rohwer
(Figs. 126 - 131)

Dirhinus luzonensis Rohwer, 1923: Phillipp. Journ. Sci. 22: 347.

Dirhinus (Dirhinoidea) luzonensis Habu, 1960: Bull. Nat. Inst. Agr. Sci. Ser. C.no. 11: 310.

Female:

Head (Fig. 126).- Black, in fronto-dorsal view a little narrow than thorax, almost as long as wide, surface compactly pitted interspaces of pits finely carinate on horns, slightly wide and not carinate on vertex; horns parallel, less than one-half as long as head, one and one-third times as long as eyes, three times as wide as interspace between horns, base of outermargin reaching level of front margin of hind ocelli; ocellar area raised and not carinate; temporae as long as compound eyes; head in lateral view one and one-half times as long as wide, genae slightly depressed below compound eyes; head in ventral

view rather wide, compound eyes small, glaborus; antennal sockets situated a little below level of ventral margin of compound eyes, lateral margins of scrobe cavity curving inwards near apex of horns, ventral margins of scrobe cavity not broadered; post clypeus transversely rugose; height of malar space lower than the major axis of eyes.

Antennae (Fig. 127).- Brown, scape six and one-half times as long as wide (0.57 ± 0.09), as long as pedicel and funicle combined; pedicel one and one-half times as long as wide (0.12 ± 0.08), as long as annellus to second funicle segment combined, annellus and funicle segments transverse, increase in width distad; club one and three-fourth times longer than wide (0.2 ±0.12)as long as preceding three funicle segments combined.

Thorax.- Black, tegulae reddish brown, with large pits on dorsal side; pits generally rather deep, pronotum with interspaces of pits carinate, scutum with compact distinct pits on posterior half, anterior half unpitted and rugose, scapulae with some sparse pits, scutellum unpitted and smooth at median area (Fig. 128), axillae compactly pitted throughout, propodeum with indistinct median carina (Fig. 129).

Fore wings-. Hyaline, almost glabrous, two and one-third times as long as wide; submarginal as long as marginal, stigmal short, post marginal absent (Fig. 190).

Hind wings.- Hyaline, three and one-half as long as wide.

Fore legs.- Coxae black, femora and tibiae brown, tarsi yellow.

Middle legs.- Coloration same as on fore legs.

Hind legs .- Black except tarsi yellow, coxae rugose on dorso-outer side, faintly punctate and pubescent on ventral side, femora sparsely and minutely punctate, without micro-sculpture on outer and inner sides.

Petiole.- Black, one and one-half times as long as wide, with 4 longitudinal carinae.

Abdomen.- Shining black, tergite I occupying four-fifth of gaster, dorsal surface smooth, lateral surfaces, rather minutely and densely punctate and setose at apex, with about 10 furrows at base and with some secondary furrows at apex, extending to one-third of tergite I, posterior margin gently emarginate at apex, subgenital plate and

ovipositor same as in D. (Montalia) trichonbthalma Masi.

Female length: 3.7 mm.

Male:

Resembles female except the following characters: Antennae (Fig. 131) with scape shorter than pedicel and funicle combined, pedicel shorter than annellus and following two funicle segments combined; mesoscutellum without unpited space in the middle.

Male length: 3.5 mm.

Holotype: ♀, ♂. India, Uttar Pradesh, Lakhimpur, 5.x.1977 (Cat. No. D-20 ♀, D-21 ♂).

Host: Unknown.

Dirhinus (Dirhinoides) lakhimpurianus sp.n.

Male:

Head (Figs. 132-133).- Black in fronto-dorsal view, a little narrow than thorax, as long as wide (0.9), surface compactly pitted, pits with narrow interspaces, microsculptured; horns parallel, less than one-half as long as head, one and

one-third times as long as wide, two times as wide as inter-space between horns, outerside distinctly rounded from apex to base, base of outer margin reaching level of front margin of hind ocelli; ocellar area raised, not surrounded by carinae, ocelli in obtuse angled triangle head in ventral view rather wide; compound eyes small, glabrous, antennal sockets situated a little below level of ventral margin of compound eyes, ventral margin of scrobe cavity not bordered, height of malar space lower than major axis of eyes; mandibles bidentate.

Antennae (Fig. 134).- Reddish brown, scape about five and a half times as long as wide (0.70 : 0.13); ring segment transverse; 1-2 funicle segments as long as wide, 3-7 wider than long; club one and a half times as long as wide (0.23 : 0.15) as long as preceding three funicle segments combined.

Thorax.- Black, tegulae reddish brown, large pits on dorsal surface, pits rather deep with wide inter-spaces between them, propodeum short, median carina in median areola indistinct, median carina behind median areola short, submedian carinae narrow, sublateralcarinae fine and wea , accessorial carinae faint (Fig. 135); microsculpture present, with silvery white pubescence.

Fore wings.- Almost glabrous, with a reddish brown patch just below stigmal vein, less than three times as long as wide (2.1 : 0.80), marginal slightly shorter than submarginal, post marginal absent, stigmal thick, thicker than marginal vein (Fig. 136); marginal fringe absent.

Hind wings.- Hyaline less than four times as long as wide; marginal fringe short.

Fore legs.- Coxae black, rest part reddish color.

Middle legs.- Coloration same as on fore legs.

Hind legs.- Black except tarsi being orange yellow, coxae and femora on outerspace with distinct pits, with silvery white pubescence; outer-ventral margin of femora with a series of short teeth.

Petiole.- Black, wider than long, with four carinae.

Abdomen.- Black, shorter than thorax, tergite I occupies about two-third of gaster with dorsal surface smooth, lateral side minutely, rather densely punctate at posterior area, dorsobasal part with 12 weak carinae, posterior margin gently emarginate at middle.

PLATE - XX

(Figs. 126 - 136)

D. (Dixhinoides) luzonensis Kolwer

126. Head (Dorsal view), ♀

127. Antenna, ♀

128. Scutellum, ♀

129. Propodeum, ♀

130. Part of venation of forewing, ♀

131. Antenna, ♂

D. (Dixhinoides) lakhimpuricnsis sp.n., ♂

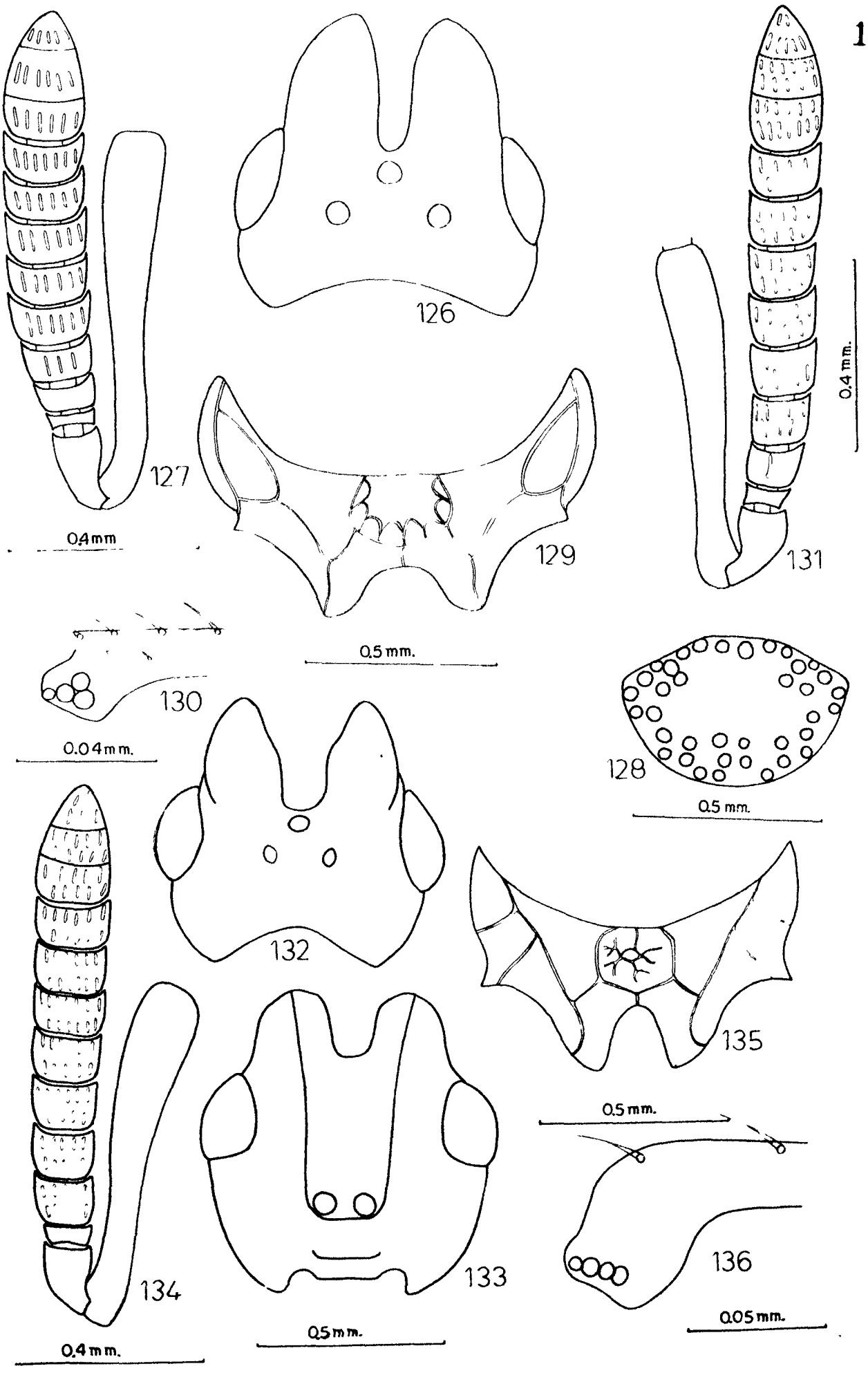
132. Head (Dorsal view)

133. Head (Ventral view)

134. Antenna

135. Propodeum

136. Part of venation of forewing.


126
127
0.4mm
129
0.5 mm.
131
0.4 mm.
130
0.04mm.
128
0.5 mm.
132
135
134
0.4mm.
133
0.5mm.
0.5 mm.
136
0.05mm.

Male length: 3.45 mm.

Holotype: ♂, India, Uttar Pradesh, Lakhimpur, 12.viii.1977. (Cat. No. d-I[illegible]).

Hosts: Unknown.

Subgenus Dirhinus Dalman

Horns with two teeth at apex, teeth more or less rounded; frons without tooth below apex of horns on lateral margins of scrobe cavity; pits on surface of head and thorax compact, but sometimes mesoscutellum with unpitted space at middle; tergite I with longitudinal carinae at basal area on dorsal side. Mani & Dubey (1974) reported 5 species of the subgenus for the first time from India. Four new species immobilicornis, aligarhensis, elevatus and girnimus have been described in the present work and a key to the species of the subgenus proposed.

Key to species of subgenus Dirhinus Dalman (After Mani, 1940)

1. Head in profile trapezoidal i.e. at least parallel on one-third middle..... 2

— Head in profile not trapezoidal but ovate triangular, sometimes nearly triangular or half moon shaped..... 7

2. Scutellum densely pitted, sometimes with a central smooth space..... 3

— Scutellum smooth on major part, pits mainly present towards the periphery; antennae blackish; tergite I with 10 furrows extending about one-fourth of tergite I; small species, parasite of Lucilia sp.; Philippine..... .....D. (D.) hankai Rohwer

3. Head in profile short one and a half longer than wide, horns low..... 4

— Head in profile, about twice longer than wide; horns more or less raised..... 6

4. Apex of horn in profile not displaced behind 5

— Head in profile with the apex displaced notably behind, (corresponding to the anterior one-third of the major orbital diameter), the internal margin little more raised from the outer margin; annellus transverse, funicle I about one and a half times as long as wide in both sexes; tergite I with 10 furrows, less than one-third of its length; Phillippine..... ..... D. (D.)maillus Masi

5. Internal margin of horns much more raised in its median part in comparison with the outer margin; head in dorsal view with the genae nearly parallel; annellus in female transverse, first funicle in female twice length of second; tergite I with 8-9 furrows increasing to 12 distally; Formosa...D. (D.) secundarius Masi

— Internal margin of horns a little more elevated from the outer margin; head in dorsal view with cheeks convergent; annellus in female nearly quadrate, third funicle in both sexes nearly quadrate or little longer than wide; tergite I with 15 - 20 furrows on anterior one-third portion; Region Mediterranean..... D. (D.) hoenxidium (Rossi)

6. Peduncle in female as wide as long; tergite I at best with furrows not or little longer than petiole numbering 8 - 10, impunctate dorsally at apex; setae on head and dorsum of thorax bright golden; wings yellowish; Philippine..... D. (D.) divus Masi

— Peduncle in female twice wider than long; tergite I with furrows evidently longer than petiole and about 15 in number, minutely punctate on dorsum; setae on head and on dorsum of thorax brass yellow; wings hardly with tinted greyish yellow; Africa, Asia Meridium..... D. (D.) excavatus Dalman

7. Margins of antennal sockets (in dorsal view) more or less broadly concave, arcuate 8

— Margins of antennal sockets (in dorsal view) convergent in the form of letter 'V', head semilunar, tergite I with 20 furrows; Nigeria..... D. (D.) silvestri

8. Males 9

— Females 11

9. Head in lateral view less wide, less than 60% of its length 10

— Head in lateral view more wider, about 72% of its length; tergite I with 12 furrows; Japan..... ..... D. (D.) nealeha Mani

10. Cheeks in dorsal view not convergent and not edged at margins, latero-posterior part of head swollen; tergite I with 9-10 furrows at base and 14 at apex; Velosea (Polgo di Fiume)..... D.(D.) parvtideus Mani

— Cheeks in dorsal view convergent behind, bulged at margins, tergite I with 7-8 furrows; Cyprus, Albania..... ..... D. (D.) cyprius Mani and *D. (D.) maarmai Mani & Dubey

11. Petiole quadrate 12

— Petiole distinctly wider than long 13

12. Scape five and a half times as long as wide; tergite I with 12 furrows; India...D. (D.) intermedius Mani & Dubey

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* D. (D.) maarmai Mani & Dubey may turn out to be a synonym of D. (D.) cyprius Mani.

— Scape 7 times as long as wide; tergite I with 8 furrows; India.....D. (D.) manhasma Mani & Dubey

13. Head in lateral view less wide, less than two-third of its length.....14

— Head in lateral view more wid, about two-third of its length; latero-posterior part of head swollen; tergite I with 10 furrows at base and 15 at apex, India... ..... D.(D.) immobilicornis sp.n.

14. Tergite I with at least 9 furrows; head and dorsum with silvery white pubescence 15

— Tergite I with 5-6 furrows; head and dorsum with golden pubescence; India..... D. (D.) aligarhensis sp.n.

15. Club narrow at apex, second funicle segment longer than wide.....16

— Club rounded at apex, funicle segments transverse, scape as long as pedicel and funicle combined; tergite I with 9 furrows at base and 14 at apex; India..... .....D. (D.) planatum sp.n.

16. Pedicel and first funicle segment as long as wide; tergite I with 10 furrows at base, 14 at apex; USSR..... ..... D. (D.) muesebeckii Nikolskaya

-- Pedicel twice longer than wide, first funicle segment longer than wide; tergite I with 9 furrows at base, 12 at apex, India..... D. (D.) circinna sp.n.

Dirhinus (Dirhinus) circinna sp.n.
(Figs. 137-138, 147, 152)

Female:

Head (Figs. 137-138).- Black, almost as long as wide in fronto-dorsal view (0.93); surface compactly pitted, interspaces of pits narrow, carinate with microsculpture, horns almost parallel, as long as eyes, twice as long as wide, inner margin almost parallel upto middle, thence diverging extreiorly, inner tooth protuberant beyond outer tooth, outer tooth rounded at apex, inner margin reaching level of anterior margin of front ocellus; ocellar area raised; eyes glabrous, as long as height of malar space (0.4); antennal sockets situated at little below level of ventral margin of eyes; ocelli in acute angled triangle; mandibles long, bidentate, with blunt teeth.

Antennae (Fig. 147).- Reddish brown; scape less than seven times as long as wide (0.63 : 0.095), shorter than pedicel

to fifth funicle segment combined; pedicel twice as long as wide, (0.16 : 0.08), ring segment transverse; first funicle as long as wide, remaining funicle segments wider than long; club 3-segmented, less than preceding three funicle segments combined.

Thorax.- Black with distinct compact pits on dorsal side, interspaces of pits narrow, partially carinate, scutellum with a slight unpitted area, with rounded apex; propodeum short with median, sub-median and accessorial carinae distinct.

Fore wings.- Smoky, less than three times as long as wide (2.4 : 0.95), sub marginal as long as marginal vein (0.75); post marginal reduced, stigmal very short (Fig. 152), disc with sparse cilia; basal one third almost glabrous; marginal fringe short.

Hind wings.- Hyaline, three and half times as long as wide; marginal fringe short.

Fore legs.- Coxa black, rest reddish brown.

Middle legs.- Coloration same as on fore legs.

Hind legs.- Black except orange yellow on tarsi; coxae with distinct punctures and pubescence on ventral side.

femora densely punctate on outer side, ventral margin with a series of teeth.

Petiole.- Black, wider than long, with 4 longitudinal carinae.

Gaster.- Black, tergite I covering two-third of gaster, with fine punctures on posterior margin, base with longitudinal carinae; subgenital plate slightly dark at the centre, with two lateral horns on anterior margin, posterior margin with two rounded lobes and a deep median notch; ovipositor concealed; outerplates of ovipositor dark on basal two-third, narrow and truncated at base, somewhat rounded at apex with a thin ridge on dorsal margin and a thick ridge on ventral margin; first valvifers with apical and basal angles at different levels, second valvifers long, narrow near base; third valvulae movably articulated with second valvifers.

Female lengths 3.55 mm.

Holotype: ♀, India, Uttar Pradesh, Aligarh, 9.viii.1979. (Cat. No. D - a).

Hosts Unknown

Paratypes: 3 ♀♀, (Data same as for holotype).

Dirhinus (Dirhinus) aligarhensis sp.n.

(Figs. 139-141, 148, 153)

Female:

Head.- Black, as long as wide in fronto-dorsal view (0.85) (Fig. 139), surface compactly pitted; interspaces of pits fairly carinate with microsculptures; horns gently diverging apically, two-third as long as compound eyes, less than twice as long as wide, as wide as space between horns, inner margin gently diverging uptill apex, outer margin almost parallel reaching level of anterior margin of front ocellus; ocellar area raised, without carinae along outer margin of hind ocelli; head in lateral aspect (Fig. 141) longer than wide; tooth at apex of horns sharp, projection near antennal socket distinct; head in ventral aspect (Fig. 140) rather wide; antennal sockets placed a little below the level of ventral margin of eyes; ventral margin of scrobe cavity well carinate gently arcuate; malar space almost as high as major axis of compound eyes; mandibles bidentate.

Antennae (Fig. 148).- Reddish brown except 6-7 funicle and club dark; scape less than seven times as long as wide (0.54:0.08), shorter than pedicel to sixth funicle segment combined; pedicel longer than wide (0.11 : 0.07); ring segment transverse; first funicle longer than wide, 2-7 funicle segments

wider than long, increasing in width distad; club twice as long as wide (0.26 : 0.13), shorter than preceding 4 funicle segments combined.

Thorax.- Black, with distinct compact large pits on dorsum, scutellum with unpitted space in the middle, interspaces of pits fairly narrow, more or less carinate, scutellum rounded at apex; propodeum wide, with distinct submedian, sublateral and accessorial carinae.

Fore wings.- Smoky about three times as long as wide (0.22:0.07), wings with sparse setae on apical two-third, basal one-third without setae; submarginal as long as marginal vein (0.67:0.66); postmarginal well developed, about twice as long as stigmal vein, stigmal short (Fig. 153).

Hind wings.- Hyaline, three and half times as long as wide; marginal fringe short.

Fore legs.- Reddish brown except dark at coxae.

Middle legs.- Coloration same as on fore legs.

Hind legs.- Black, tarsi orange yellow; outersurface of coxae and femur densely pitted with silvery white pubescence; inner margin of femur with a series of comb like teeth.

Petiole.- Black, wider than long, with 4 longitudinal carinae.

Gaster .- Black, tergite I occupies about two third of gaster, basal area with 6 furrows; subgenital plate with lateral lobes on anterior margin, posterior margin with a notch in the middle; ovipositor concealed; outerplates of ovipositor narrow and truncated at base, somewhat rounded at apex, with a thick ridge on ventral margin and a thin ridge on dorsal margin; first valvifer with apical and basal angles at different levels, second valvifers long, narrow at sub apex; third valvulae movably articulated with second valvifers.

Female length: 3.1 mm.

Holotype: ♀, India, Uttar Pradesh, Aligarh, 6.viii.1979. (Cat. No. D - 8).

Host: Unknown.

Dirhinus (Dirhinus) elevatus sp.n.

(Figs. 142 - 143, 149, 151, 154)

Female:

Head (Figs. 142-143).- Black, a little narrow than thorax, as long as wide (0.71); surface compactly pitted, pits more wider than ventral surface below compound eyes, interspaces

narrow and finely carinate, with silvery white pubescence, horns parallel, about one-third of head length, nearly half as long as wide, twice long as interspace between horns, base extending upto the outer margin of front ocellus; ocellar area raised; antennal sockets situated a little below level of ventral margin of compound eyes; height of malar space less than the major axis of eyes.

Antennae (Fig. 149).- Blackish brown, scape less than five times as long as wide (0.55 : 0.12); as long as pedicel and funicle combined; pedicel about twice as long as wide (0.15 : 0.07), as long as ring and 1-2 funicle segments combined; funicle segments wider than long with increase in width distad; club longer than wide (0.22 : 0.17), longer than preceding three funicle segments combined.

Thorax.- Black, tegulae reddish brown; pronotum densely pitted, pits wide, interspaces narrow and carinate, scutum compactly pitted except at apical median surface, parapsides and axillae with very few pits, scutellum with median apical two-third surface unpitted (Fig. 151); propodeum with a distinct median carina behind median areola, accessory, submedian and sublateral carinae distinct, lateral costae with a sharp tooth.

Fore wings.- Hyaline, almost glabrous, about two and a half times as long as wide (1.55:0.69), submarginal as long as marginal, post marginal slightly longer than marginal vein (Fig. 154); marginal fringe absent.

Hind wings.- Hyaline, about three and a half times as long as wide.

Fore legs.- Coxae black, remaining part reddish brown.

Middle legs.- Coxae and tibiae except apex and base black, femora, apex and base of tibiae and tarsi reddish brown.

Hind legs.- Black, tarsi reddish, coxae and femora densely pubescent.

Petiole.- Black, wider than long with 4 carinae on dorsum.

Gaster .- Black, tergite I covers about three-fourth of abdomen, emarginate at apex, basal area with 14 furrows, furrows as long as half length of tergite I, almost glabrous, apical one-fourth densely punctate, punets arranged in few transverse rows; tergites 2-7 surely setose; subgenital plate with a deep notch on posterior margin.

Female length 2.6 mm.

Holotype ♀, India, Uttar Pradesh, Aligarh, 22.iii.1976. (Cat. No. D-g).

Host: Unknown.

Paratypes ♀. (Data same as for holotype).

Mirhiza (Mirhiza) longilicornis sp.n.
(Figs. 144 - 146, 150, 155)

Female

Head (Figs. 144-146).- Black, nearly as long as wide in fronto-dorsal view (1.2), dorsum compactly pitted, pits with narrow and carinated interspaces; microsculptures present, horns longer than wide, with narrow space between the horns, shorter than major axis of eyes; outer margin almost parallel, reaching level of outer margin of front ocellus, ocellar area raised; without carinae, ocelli in acute angled triangle; head in ventral aspect as long as wide; antennal sockets placed below ventral margin of eyes; ventral margin of scrobe cavity well carinate, gently arcuate; malar space as high as major axis of compound eyes; mandibles bidentate.

Antennae (Fig. 150).- Reddish brown, scape less than seven times as long as wide (0.71 : 0.11), as long as pedicel

to sixth funicle segment combined; pedicel about twice as long as wide (0.17 : 0.09); first funicle longer than wide, 2-7 funicle segments wider than long with increase in width distad; club less than twice as long as wide (0.22 : 0.12), as long as preceding three funicle segments combined;

Thorax.- Black, dorsal surface compactly pitted, pits fairly deep, with narrow interspaces, interspaces of pits fairly carinate; propodeum flat with distinct carinae.

Fore wings.- Smoky near veins, less than three times as long as wide (2.4 : 0.9) base without cilia, apical two-third with sparse cilia; submarginal as long as marginal, post marginal and stigmal veins reduced (Fig. 155); marginal fringe obsolete.

Hind wings.- Hyaline, three and one-half as long as wide; marginal fringe reduced.

Fore legs.- Coxa black, remaining part reddish brown.

Middle legs.- Coloration same as on fore legs.

Hind legs.- Black, tarsi orange yellow; coxae and femora densely pitted with pubescence on outer surface; inner margin of femur with a row of short teeth.

Petiole.- Black, wider than long.

Gaster .- Black, tergite I and II setose on posterior margin; subgenital plate with lateral horns on anterior margins, posterior margin with a deep notch in the middle; outerplates of ovipositor narrow and truncated at base, somewhat rounded at apex, with a thick ridge on ventral margin and a thin ridge on dorsal margin; first valvifers with apical and basal angles at different levels, second valvifers long, third valvulae movably articulated with second valvifers.

Female length: 3.3 mm.

Holotype: ♀, India, Uttar Pradesh, Aligarh, 6.vii.1979. (Cat. No. D-d).

Host: Unknown.

PLATE - XXI

(Figs. 137 - 146)

137. Mirhinus (Mirhinus) circinus sp.n.: Head (Dorsal view)♀

138. D. (D.) circinus sp.n. : Head (Ventral view),♀

139. D. (D.) aligarhensis sp.n. : Head (Dorsal view), ♀

140. D. (D.) aligarhensis sp.n. : Head (Ventral view),♀

141. D. (D.) aligarhensis sp.n. : Head (Lateral view), ♀

142. D. (D.) elevatus sp.n. : Head (Dorsal view), ♀

143. D. (D.) elevatus sp.n. : Head (Ventral view),♀

144. D. (D.) immobilicornis sp.n.: Head (Dorsal view), ♀

145. D. (D.) immobilicornis sp.n.: Head (Ventral view),♀

146. D. (D.) immobilicornis sp.n.: Head (Lateral view),♀

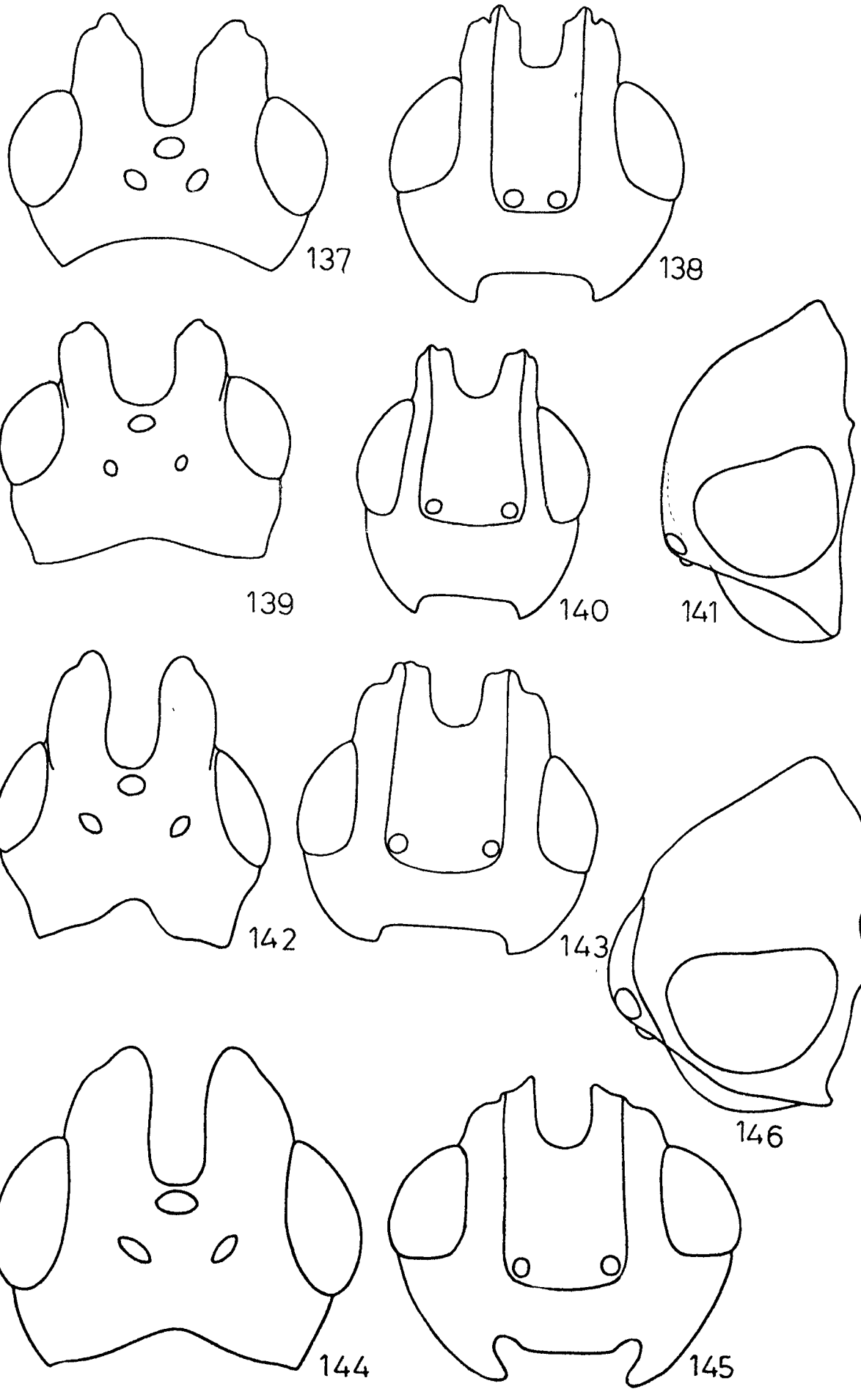

137
138
139
140
141
142
143
146
144
145
0.5 mm.

PLATE - XXII

(Figs. 147 - 155)

147. Dixhinus (Dixhinus) circinus sp.n. : Antenna, ♀

148. D. (D.) aligarhensis sp.n. : Antenna, ♀

149. D. (D.) elevatus sp.n. : Antenna, ♀

150. D. (D.) immobilicornis sp.n. : Antenna, ♀

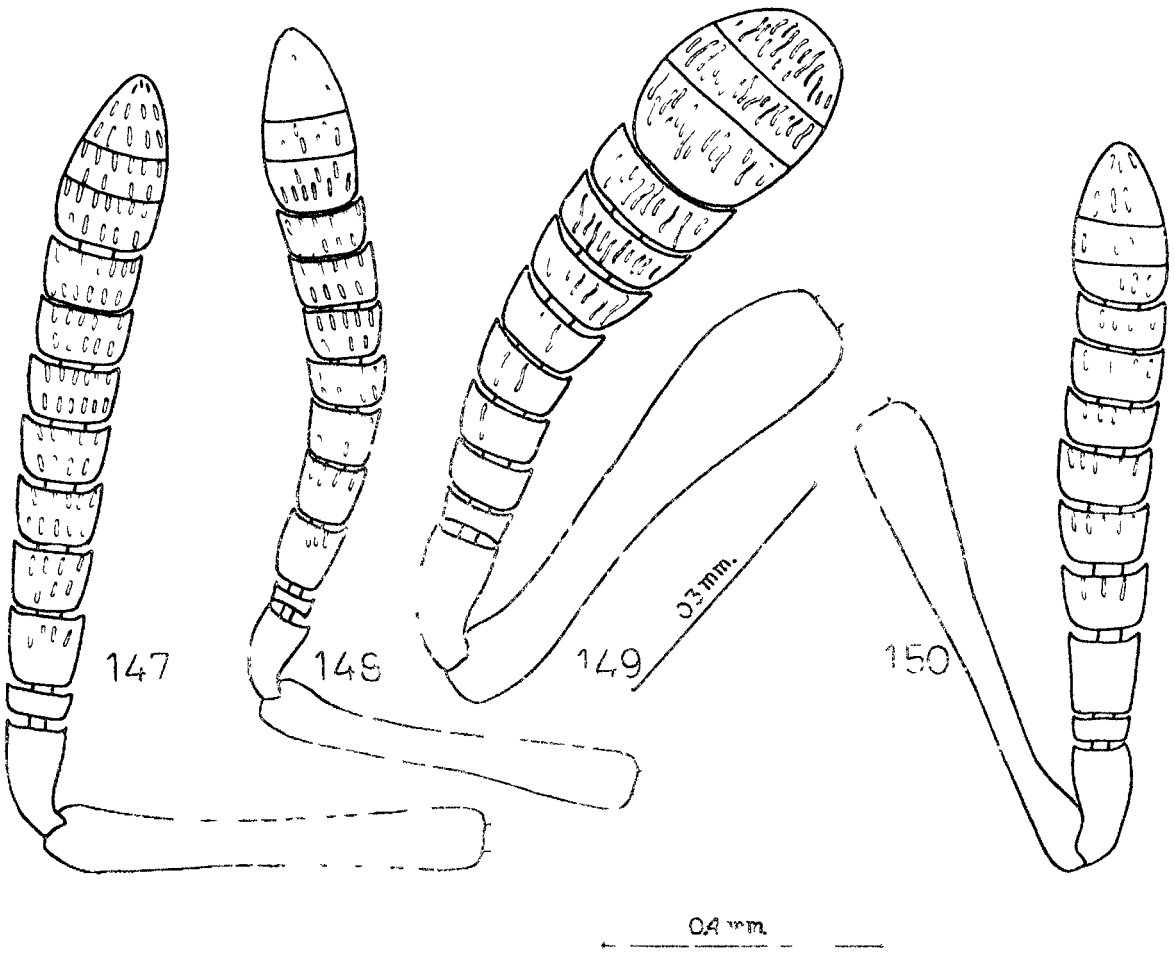
151. D. (D.) elevatus sp.n. : Scutellum, ♀

152. D. (D.) circinus sp.n.: Part of venation of forewing, ♀

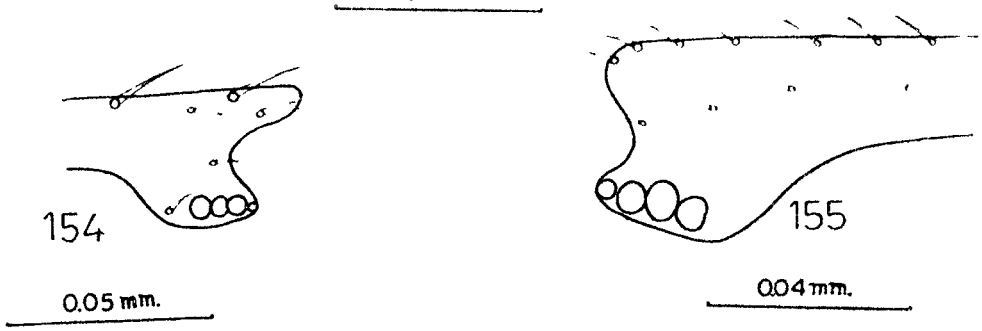
153. D. (D.) aligarhensis sp.n.: " " " " " ♀

154. D. (D.) elevatus sp.n.: " " " " " ♀

155. D. (D.) immobilicornis sp.n.: " " " " ♀


147
148
149
150
0.3 mm.
0.4 mm.


152
153
0.04 mm.


154
155
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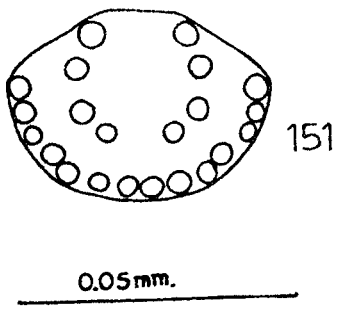

151
0.05 mm.

Subfamily Epitraninae

Head without horns on dorsal area of frons; antennae inserted distinctly below level of ventral margin of eyes near clypeus; hind tibiae obliquely sinuate at apico-dorsal portion, ventral and apical margins form prolonged, sharp projections; abdomen with long petiole, petiole not laminated at anterior margin.

The genus Epitranus described by Walker in 1834 was placed in the tribe Smicrini by Ashmead (1896). Burks (1936) raised the tribe - Epitranini for accomodation of Epitranus Walker and declared Chalcitella Westwood, 1834; Anacerratus Kirby, 1883; Arrhenocera Kirby, 1883; Platychalcis Cameron, 1904; Arrhenocerididella Girault, 1913; Chalcitelloides Girault, 1914 and Arrhenocerides, Girault, 1915 synonyms to Epitranus Walker 1834. Schmits (1946) added 10 new species from the Belgium-Congo. Masi (1947) is in agreement with Burks concerning tribal nomenclature. Burks (1951) raised the tribe Epitranini to subfamily Epitraninae. Steffan (1957) endorsed the synonymy proposed by Burks (1936) and further added 7 new species from Belgium-Congo. Kalm (1960, 62) synonymised Neoanacerratus Girault, 1913; Paranacerratus Girault, 1915; Arrhenocerides Girault, 1915 and Paraarrhenocerides Masi, 1938

with Spitrama Walker and added 3 species from Japan including a new species. Peck (1963) endorsed the synonymies proposed earlier. Peck et al (1964) listed one species from the Czechoslovakia. Mani et al. (1973, 74) treated Anacryptus, Arrhenocera and Chalcitella as separate genera under the subfamily Chalcitellinae (now Spitraminae) and described 19 new species from India. They have however given no reasons in support of their view.

Farroqi (1976) discussed the possibility of separation of species of genera Arrhenocera and Chalcitella on the basis of their ♀ and ♂ genital components.

Tribe Enitranini

It was formerly known as Chalcitellini and is characterised by petiolated abdomen; antennae inserted near clypeus; hind tibiae sinuate at apex;

This tribe contains only one genus Enitranna Walker.

Genus Enitranna Walker

Genotype: Enitranna falvescens Walker, 1834.

Walker, 1834: Ent. Mag. 2: 21.- Walker, 1862: Trans. Ent. Soc. London, 1: 349.- Cresson, 1865: Proc. Ent. Soc. Phil. 4: 100.- Walker in Smith, 1874: Trans. Ent. Soc. London.: 400.- Kirby 1884: Journ. Linn. Soc. London, Zool. 17: 55.- Cameron, 1888: Proc. Soc. Monch. Lit. Phil. Soc. 36: 3 .- Dalla Torre, 1898: Cat. Hym. 5: 283.- Ashmead, 1904: Mem. Car. Mus. I: 251.- Schmiedeknecht, 1909: Gen. Ins., 97: 37.- Burks 1936: Proc. Nat. Acad. Sci. 22: 286.- Masi, 1936: Ann. Mus. Genova, 59: 184.- Schmits, 1946: Expl. Parc. nat. Albert, Miss. de Witte fasc. 48: 160.- Steffan, 1957: Rev. Zool. Bot. Afr. 55: 71.- Habu, 1960: Bull. Nat. Inst. Agr. Sci. (Japan), ser. C.no. 11: 296.- Habu, 1962: Fauna Japonica : 127 .- Habu, 1962 :

Kontyu, 34: 127.- Mani, 1973: Mem. Sch. Ent., St. John. Coll. Agra, no. 2: 7.- Mani, 1974: Mem. Sch. Ent., St. John. Coll. Agra, no. 3: 23.- Farroqi, 1976: Orient Ins. 10(3): 394.

Synonyms:

Chaloitella Westwood, 1835: Proc. Zool. Soc. London: 70.
Genotype: Chaloitella evanioides Westwood.

Anaerytus Kirby, 1884: Journ. Linn. Soc. London, Zol. 17: 544.
Genotype: Znitrauma immulator Walker.

Arratocera Kirby, 1884: Journ. Linn. Soc. London, Zool. 17:54.
Genotype: Znitrauma albinennis Walker.

Arratocerpidella Girault, 1913: Arch. Naturg. Jahrg. 79A(6): 86.
Genotype: Arratocerpidella flava Girault.

Hecanaerytus Girault, 1913: Arch. Naturg. Jahrg. 79(6)A: 86.
Genotype: Hecanaerytus notiolatus Girault.

Chaloitelloides Girault, 1914: Ent. News, 25: 30.
Genotype: Chaloitelloides nigriscutum Girault.

Paranaerytus Girault, 1915: Mem. Queensland Mus. 4: 347.
Genotype: Paranaerytus sanguinens Girault.

Arratocerpides Girault, 1915: Mem. Queensland Mus. 4: 351.
Genotype: Arratocerpides feralis Girault.

Pararrhaconeuridae Mani, 1938: Cat. Ins. Pt. 23: 149.

Genotype: Arrhaconeuridae ceylonensis Mani, 1936.

Chalcitella Mani & Dubey, 1973: Mem. Sch. Ent., St. John's Coll. Agra, India, no. 2: 7.

Arrhaconeura Mani & Dubey, 1973: Ibid.: 13.

Anacerrhina Mani & Dubey, 1973: Ibid.: 30.

Chalcitella Mani & Dubey, 1974: Ibid., no. 3: 24.

Arrhaconeura Mani & Dubey, 1974: Ibid.: 28.

Genus Epitranus was erected by Walker in 1834 and was misplaced by Ashmead in tribe Smicrini. The condition of insertion of antennae takes it out from the tribe Smicrini and brings it to Chalcitellini. Since Epitranus Walker, 1834 has priority over Chalcitella Westwood, 1834, which is generically also not distinct, Chalcitella has been declared a junior synonym to Epitranus and the tribe renamed Epitranini. Anacerrhina Kirby, 1883 is known for minor differences in the antennae and cannot be held distinct from the genus Epitranus. The genera Arrhaconeuridella Girault 1913, Chalcitelloidea Girault 1914, and Arrhaconeuridea Girault, 1915, were erected solely on the differences in the number of antennal segments, which are not applicable at the

generic level. These have correctly been declared synonym by Burks (1936), Steffan (1967); Habu (1960, 1962) and Peck (1963).

Mani and Dubey (1973, 1974) however retained Chalcitella, Anaecryntus and Arrhatocera as separate genera. Since they have not discussed the synonymies it is not possible to comment upon their stand at this stage.

From the drawings and descriptions given by them for the species of Chalcitella, Anaecryntus and Arrhatocera, these are beyond doubt species of Enitranus. As such it is proposed to transfer these species to Enitranus as new combinations.

Genus Enitranus Walker differs from other related genera in the following manner:

Head strongly contracted below compound eyes in ventro-frontal aspect; pre and post orbital carinae distinct; antennal sockets placed just above the fronto-clypeal suture; scutellum rounded at apex; wings almost glabrous, post marginal vein absent; hind femora with one large tooth following comb like teeth or with simple large teeth on outer-ventral margin; hind tibiae with a sharp projection at apical ventral margin; petiole moderately long with longitudinal carinae; gaster compressed from sides; tergite I with

basal margin carinated.

Besides the proposed new combinations, ten species have been described and a key to the species of the genus Enitranna proposed.

Key to species of the genus Enitranna Walker.

1. Fore wings with reduced venation 2

— Fore wings with venation normal 3

2. Fore wings with base of submarginal visible; antennae 10-segmented, without annelus, club massive, unsegmented..... E. anacrouna Steffan

— Fore wings with marginal vein not well defined, less than one half as long as submarginal; antennae 11-segmented, annellus present, club 2-segmented..... E. shirakii Habu

3. Hind femora with a series of comb like-teeth..... 4

— Hind femora with simple large teeth..... 6

4. Clypeus trilobed..... 5

— Clypeus rounded at apex..... 6

5. Fore wings fumate, lateral costae of propodeum with a recurved tooth..... E. aminaicina Steffan

— Fore wings hyaline; lateral costae of propodeum with 3 teeth..... E. albipennis Walker*

* (=Arrhenocera albipennis Kirby = Anacrotina ajmaniana Ashmead = Anacrotina bombaica Ashmead).

6. Club distinctly 2-segmented..... 7

— Club distinctly 3-segmented; scape 5 times as long as wide; stigmal vein fairly developed..... ..... E. parvitenuis (Mani & Dubey) Comb.n. (= Anacryptus parvitenuis Mani & Dubey)

7. Funicle segments 2-7 subsquare, club shorter than annellus to 4th funicle segment combined; hind femora with 24 teeth..... E. particellus sp.n.

— Funicle segments 4-7 wider than long; club as long as annellus to 2nd funicle segment combined; hind femora with 22 teeth..... E. kashmirienais sp.n.

8. Antennae 11-segmented, club unsegmented..... 9

— Antennae 12 or 13 segmented with club 2 or 3 segmented respectively..... 22

9. Stigmal vein reduced as an enlargement of marginal vein parallel to wing margin of fore wings..... 10

— Fore wings with well developed stigmal vein, making an angle of 45° with the wing margin..... 14

10. First funicle segment short, shorter than pedicel..... 11

— First funicle segment long, longer than pedicel..... 12

11. Scape 4 times as long as wide, petiole 4 times as long as wide; hind femora with 9 teeth..... ..... E. horivilia (Mani & Dubey) Comb.n. (=Chaleitella horivilia Mani & Dubey)

-- Scape 6 times as long as wide; petiole 5 times as long as wide; hind femora with 8 teeth..... ..... E. malabarensis (Mani & Dubey) Comb.n. (=Chaleitella malabarensis Mani & Dubey)

12. Antennae and legs dark 13

-- Antennae and legs reddish; frontal lobe rounded at apex; inter-antennal lamellae absent; petiole five and one-half times as long as wide..... E. anificus Steffan

13. Club as long as annellus and 1-3 funicle segments combined..... E. kivuensis (Schmitz) (=Anacryptus kivuensis Schmitz)

-- Club as long as annellus and 1-2 funicle segments combined..... E. monticola (Mani & Dubey) comb.n. (=Chaleitella monticola Mani & Dubey)

14. Hind femora with 15-20 teeth..... 15

-- Hind femora with not more than 10 teeth..... 16

15. Scape five and one-half times as long as wide; hind femora with 17-20 teeth..... E. inema Steffan

-- Scape 7 times as long as wide; hind femora with 13 teeth.....*E. filicornis* Steffan

16. Antennae dark..... 17

-- Antennae reddish brown 18

17. Scape 7 times as long as wide; petiole 6 times as long as wide; hind femora with 9 teeth..... ..... *E. annexia* (Mani & Dubey) Comb.n. (=*Chalcitella annexia* Mani & Dubey)

-- Scpae 5 times as long as wide, petiole 5 times as long as wide; hind femora with 8 teeth..... ..... *E. nilamburensis* (Mani & Dubey) Comb.n. (=*Chalcitella nilamburensis* Mani & Dubey)

18. Tarsal gutter of hind tibia not extending to the apophyses, if not, tarsal gutter narrow and shoot out towards the internal part of the ventral side of tibia, infront reaching to apophyses; small species at most 4.5 mm..... 19

-- Tarsal gutter of hind tibiae evident, very deep, over-all the ventral face of tibiae, the tarsal insertion upto apophyses; large size species atleast 5 mm..... 20

19. Submedian carinae of propodeum not reaching the cell articulation or very near to cell articulation; areolae a2 and a3 separated by a distinct carinae; petiole 4 times as long as wide..... E. exultans Steffan

— Submedian carinae of propodeum robust and reaching to the cell articulation, areolae a2 and a3 confluent, separation of carinae incomplete or absent; petiole three times as long as wide..... E. insanitus Steffan

20. Head in part reddish, head and dorsum of thorax covered with silken hairs; lateral carinae of pronotum extending to the dorsum of thorax, the region median of pronotum not or little depressed..... 21

— Head and thorax entirely brown, covered with golden hairs; lateral carinae of pronotum on the dorsum form two tubercles with a depression..... E. nitidus (Schmits) (=Anaerrotus nitidus Schmits)

21. Thorax with pronotum reddish brown; (♀) funicle I subsquare or little wider; (♂) antennae short, flagellum twice longer than scape, funicle I slightly longer than wide; propodeum with submedian carinae incomplete not reaching to cell articulation; areolae a2 and a3 minutely punctured..... E. rubricolor (Schmits) (=Anaerrotus rubricolor Schmits)

— Thorax entirely black; (♀) antennae with funicle I slightly longer than wide; (♂) antennae very long, flagellum three times longer than scape, funicle I twice longer than wide; propodeum with submedian carinae reaching to cell articulation; areolae a2 and a3 shining..... E. observator Walker
(=Anaerytus bayoni Masi = Anaerytus bayoni Schmits
=Anaerytus macrocera Schmits)

22. Antennae 13-segmented, club 3-segmented..... 23

— Antennae 12-segmented, club 2-segmented..... 32

23. Males 24

— Females 25

24. Fore wings with reduced stigmal vein, petiole 6 times as long as thick...E. sanctijohani (Mani & Dubey) Comb.n.
(=Arrhenocera sanctijohani Mani & Dubey)

— Fore wings with identical stigmal vein, petiole 8 times as long as thick..... E. nallaya (Mani & Dubey) Comb.n.
(=Arrhenocera nallaya Mani & Dubey)

25. Fore wings with identical vein..... 26

-- Fore wings with reduced stigmal vein; first funicle segment shorter than other; hind femora with 6 teeth..... ..... E. ultima (Mani & Dubey) Comb.n. (=Arrhatocera ultima Mani & Dubey)

26. Hind femora with 12 teeth 27

-- Hind femora with not more than 10 teeth 28

27. Scape 4 times as long as wide; fore and middle legs reddish color..... E. ambadevia (Mani & Dubey) Comb.n. (=Arrhatocera ambadevia Mani & Dubey)

-- Scape 3 times as long as wide; fore and middle legs brownish black.....E. malabarensis (Mani & Dubey) Comb.n. (=Arrhatocera malabarensis Mani & Dubey)

28. Body ferruginous brown 29

-- Body predominantly black 30

29. Scape 6 times as long as wide, petiole 5 times as long as wide; hind femora with 89 teeth..... ..... E. ramnathi (Mani & Dubey) Comb.n. (=Arrhatocera ramnathi Mani & Dubey)

— Scape 7 times as long as wide; petiole 3-times as long as wide; hind femora with 10 teeth..... ..... E. cavitorensis (Mani & Dubey) Comb.n. (=Anacryptus cavitorensis Mani & Dubey)

30. Fore and middle legs black..... 31

— Fore and middle legs reddish brown; scape 7 times as long as wide; petiole five and one-half times as long as wide; hind femora with 10 teeth..... .....E. taniorensis (Mani & Dubey) Comb.n. (=Arrhenocera taniorensis Mani & Dubey)

31. Scape 7 times as long as wide, petiole 4 times as long as wide..... E. nilamburensis (Mani & Dubey) Comb.n. (=Arrhenocera nilamburensis Mani & Dubey)

— Scape 8 times as long as wide, petiole 6 times as long as wide..... E. ambiamontana (Mani & Dubey) Comb.n. (=Arrhenocera ambiamontana Mani & Dubey)

32. Fore wings with well developed stigmal vein making an angle of 45 with the wing margin..... 33

— Fore wings with stigmal vein reduced to an apical expansion of marginal, parallel to wing margin; first funicle segment transverse; hind femora with 7 teeth..... ..... E. nigrum sp.n.

33. Propodeum with distinct submedian carinae, reaching to cell articulation with the petiole 34

— Propodeum with submedian carinae short, not reaching to cell articulation with the petiole.....35

34. Hind coxae black, hind femora brown; scape five and one-half times as long as wide, club as long as annellus to half of 5th funicle segment combined; petiole more than 4 times as long as wide..... ..... E. aguminatus sp.n.

— Hind legs reddish; scape less than 5 times as long as wide; club as long as annellus to 2nd funicle segment combined; petiole 4 times as long as wide..... ..... E. indicus sp.n.

35. Head reddish 36

— Head black, scape 7 times as long as wide, club as long as annellus to 2nd funicle segment combined; hind femora with 9 teeth; ovipositor exserted..... ..... E. melanocerus sp.n.

36. Propodeum with areola s4 large extending to the articular surface; hind coxae densely pitted on ventral surface.....37

— Propodaeum with areola a4 short, not reaching to articular surface; hind coxae unpitted.....38

37. Scape seven and one-half times as long as wide, hind femora with 13 teeth; petiole less than three times as long as wide ..... E. *giganticum* sp.n.

— Scape 6 times as long as wide, hind femora with 9 teeth; petiole four and one-half times as long as wide..... E. *simulans* sp.n.

38. Funicle segments longer than wide, petiole 4 times as long as wide; abdomen dark brown..... E. *areolatus* sp.n.

— Funicle segments 1-2 longer than wide, 3-6 subsquare, 7th wider than long; petiole four and one-half times as long as wide; abdomen reddish.....E. *masicornus* sp.n.

Eritrauma verticellus sp.n.

(Figs. 159, 172, 184, 194)

Female:

Head.- Reddish except eyes, ocelli and occipital area dark; pronotum reddish, mesonotum brown with dark area near sututes and pits on anterior surface of scutum, legs reddish brown, hind femora dark brown; petiole reddish brown; abdomen brownish black except apical one-fourth reddish with apex of genitalia black.

Head.- Wider than long in facial view, distinctly wider than thorax, with fine sculpture and silvery white pubescence; pre orbital carinae distinct; fronto-genal sutures obsolete; clypeus rounded at apex; scrobe cavity unexcavated, rugose; ocelli in obtuse angled triangle, basal ocellus removed from eye rim by slightly more than its diameter, and from occipital margin by more than thrice its diameter.

Antennae (Fig . 159).- Scape short not reaching front ocellus, about six times as long as wide (0.61 : 0.1), as long as pedicel to 5th funicle segment combined; pedicel slightly longer than wide; annellus transverse; first funicle

one and a half times as long as wide, 2-7 as long as wide with increase in length and width distad; club 2-segmented, two and one-half times as long as wide (0.24 : 0.1), as long as annellus to half of 4th funicle segment combined.

Thorax.- Compactly pitted, interspaces of pits narrow and carinated on pronotum, wider and smooth on scutellum; with silvery white pubescence, propodeum with submedian, sublateral and accessorial carinae (Fig. 172).

Fore wings.- Hyaline, almost glabrous, less than three times as long as wide (2.38 : 0.85), stigmal well formed, makes an angle of 45° with the wing margin.

Hind wings.- Hyaline, about three and a half times as long as wide, marginal fringe short.

Hind legs .- Covered with silvery white pubescence, coxae on inner surface with compactly arranged shallow pits, femora less than twice as long as wide, outer ventral margin with a robust tooth followed by 23 small teeth (Fig.184).

Petiole.- Slightly more than three times as long as wide, dorsally with three longitudinal carinae.

Gaster (Fig. 194).- Accuminate at apex, sparsely setose, densely microsculptured; tergite I covers about two-third of gaster; ovipositor slightly exserted; subgenital plate and ovipositor same as in E. kashmirensis sp.n

Female length 3.54 mm.

Holotype: ♀, India, Uttar Pradesh, Aligarh, ex. Euxanthera particalla Rag. on Solanum melongena L., 6.vii.1979. (Cat. No. C-I).

Enitranma kashmiriensis sp.n.

(Figs. 160, 165, 173, 185, 195, 204, 208)

Female

Head dark brown except reddish on parascrobal and ocellar areas, antennae and pronotum reddish, mesonotum ferruginous red with furrows along the side of sutures and pits dark, propodeum reddish brown, fore and middle legs reddish brown; hind coxae brownish black on dorsal surface, ventral surface reddish, femora predominantly dark, abdomen reddish, slightly brown on dorsum.

Head.- Wider than long in facial view, wider than thorax, densely pitted with moderate pits, pits with very narrow interspaces, with silvery white pubescence, scrobe cavity unexcavated, rugose; pre orbital carinae distinct; fronto-genal sutures obsolete, clypeus rounded at apex; inter-antennal lamellae present, ocelli in obtuse angled triangle, basal ocellus removed from eye rim by more than its own diameter and from occipital margin by about thrice its diameter; mandibles bidentate.

Antennae (Fig. 160).- Scape short, not reaching front ocellus, six times as long as wide (0.54 : 0.1) as long as pedicel to half of fifth funicle combined; pedicel longer than wide; annellus transverse; first funicle longer than wide (0.11 : 0.09), 2-3 subsquare, 4-7 wider than long, increase in width distad; club 2-segmented, less than two times as long as wide (0.24 : 0.13), as long as annellus and 1-2 funicle segments combined.

Thorax.- Pronotum compactly pitted with narrow and carinated interspaces, mesonotum with moderate pits, interspaces wide, as wide as diameter of pits, surface shining, pits with silvery white pubescence; propodeum with submedian lateral and accessorial carinae, lateral costae without tooth (Fig. 175).

Fore wings.- Hyaline, almost glabrous, about two and a half times as long as wide (2.4 ± 0.09), stigmal vein well formed, makes an angle of 45° with the margin.

Hind wings.- Hyaline, nearly three and half times as long as wide; marginal fringe short.

Hind legs.- Ventral surface of coxae densely pitted with shallow pits, interspaces of pits narrow, coxae and femora covered with silvery white pubescence, outer-ventral margin of femora with a robust basal tooth following comb like short 21 teeth (Fig. 185).

Petiole.- About two and three-fourth as long as wide, dorsal surface with 3 longitudinal carinae.

Gaster (Fig. 195).- Accuminate at apex, almost glabrous, only with few sparse setae; tergite I covers more than two-third gaster; subgenital plate and ovipositor as in Figs. 204 and 206 respectively.

Female length: 3.85 mm.

Male

Resembles female in all respects except for the following characters:

Antennae (Fig. 165).- Scape more than six times as long as wide (0.54 : 0.08), as long as pedicel to about half of 4th funicle segment combined, 1-4 funicle segments longer than wide, remaining funicle segments as long as wide, club more than two times as long as wide (0.28 : 0.12), as long as preceding three funicle segments combined.

Male length: 3.2 mm.

Holotype: ♀, ♂, India, Andhra Pradesh, Hydrabad, 18.iii. 1976. (Cat. No. Q-2).

Host: Unknown

Paratypes: 7 ♀♀, 2 ♂♂

Geographical distribution: Srinagar (Jamm & Kashmir) and Aligarh (U.P.)

Exitranna nigrum sp.n.

(Figs. 161, 166, 180, 186, 196, 205, 209)

Female

Head black, antennae yellowish red, thorax black, tegulae reddish brown, wings hyaline, fore and middle legs orange yellow, hind legs brownish black, petiole brownish black, abdomen black.

Head.- Wider than long in facial view, distinctly wider than thorax, with silvery white pubescence, pre orbital carinae well developed, clypeus rounded at apex, inter-antennal lamellae present, fronto-genal suture obsolete, scrobe cavity unexcavated, rugose not exceeding front-ocellus, ocelli in obtuse angled triangle, basal ocellus removed from eye and from occipital margin by about twice of its diameter, maxillary and labial palpi 4 and 3 segmented respectively, mandibles bidentate.

Antennae (Fig. 161).- Scape short, not reaching front ocellus, about four and a half times as long as wide (0.31 : 0.07), as long as pedicel to 5th funicle segment combined; pedicel longer than wide (0.06 : 0.05); ring segment twice wider than long; 1-2 funicle segments wider than long, 3-7

as long as wide; club 3-segmented, two and a half times as long as wide (0.22 : 0.09), shorter than ring to 4th funicle segment combined.

Thorax.- Compactly pitted, with moderate pits, interspaces of pits less than their diameter, shagreened with silvery white hairs; propodeum with distinct submedian, lateral and accessory carinae, lateral costae with a robust tooth.

Fore wings.- Hyaline, almost glabrous, about three times as long as wide (1.82 : 0.6), marginal shorter than submarginal, post marginal absent, stigmal reduced, only as a simple expansion of marginal running parallel with the wing margin (Fig. 180).

Hind legs.- Coxae as long as femora, femora less than twice as long as wide, outer-ventral margin of femora with a basal robust tooth followed by 6 teeth (Fig. 186), with silvery white pubescense.

Petiole.- Four times as long as wide, with 3 longitudinal carinae on dorsal surface.

Gaster (Fig. 196).- Tergite I covers three-fourth of abdomen, distinctly emarginate on dorsal surface, subgenital

plate with two lateral horns on anterior margin, posterior margin with a deep notch in the middle (Fig. 205); outer plates of ovipositor narrow at base, broad near apex, with a thick muscular ridge along ventral margin; first valvifers subtriangular, with apical and basal angles at different levels; second valvifers long, very narrow near apex; third valvulae long about one-third of second valvifers and movably articulated to it (Fig. 209).

Female length: 2.39 mm.

Male:

Resembles female in all respect except the following differences:

Antennae (Fig. 166).- Scape four times as long as wide (0.33 : 0.08); pedicel in subsquare; funicle segments longer than wide, decrease in length distad; club 2-segmented, three times as long as wide (0.25 : 0.09), shorter than annellus and three funicle segments combined.

Male length: 2.35 mm.

Holotype: ♀, ♂, India, Andhra Pradesh, Hydrabad, 20.iii. 1976 (Cat. No. H-I).

Host: Unknown

Paratypes: 10 ♀♀, 5 ♂♂ (Data same as for holotype)

Epitranus acuminatus sp.n.

(Figs. 156-158, 162, 174, 187, 197, 206, 210)

Female:

Head black, antennae reddish, thorax black, tegulae reddish, fore and middle legs reddish, hind coxae brownish black, hind femora predominantly brown, tibiae reddish, tarsi orange yellow, petiole reddish brown, tergite I predominantly black, tergites 2-7 reddish.

Head (Figs. 156-158).- Wider than long, wider than thorax, with silvery white pubescence, scrobe cavity unexcavated, transversely rugose; pre orbital carinae distinct; fronto-genal sutures obsolete; clypeus rounded at apex; inter-antennal lamellae present; ocelli in obtuse angled triangle basal ocellus removed from eye rim by twice its diameter, from occipital margin by about three times its diameter.

Antennae (Fig. 162).- Scape short not exceeding to front-ocellus, about five and a half times as long as wide (0.3[illegible] : 0.055), as long as pedicel to half of 5th funicle segment combined, pedicel slightly longer than wide; anneliis transverse, funicle segments 1-7 subequare, increase in length

distad; club 2-segmented, two and a half times as long as wide (0.24 : 0.10), as long as annellus to half of 5th funicle segment combined.

Thorax.- Densely pitted, pits on scutellum comparatively wider than on scutum, interspaces between pits narrow, carinate on pronotum, with silvery white pubescence; propodeum with distinct submedian, lateral and accessorial carinae, lateral costae without tooth. (Fig. 174).

Fore wings.- Hyaline, almost glabrous, two and a half times as long as wide (1.1 : 0.9), post marginal absent, stigmal well formed, makes an angle of 45° with the wing margin.

Hind legs.- Shagreened with silvery white pubescence, femora about twice as long as wide, outer-ventral margin with a basal robust tooth followed by 9 teeth (Fig. 187).

Petiole.- Four and three-fourth times as long as wide, with four longitudinal carinae on dorsal surface.

Gaster (Fig. 197).- Accuminate at apex, almost glabrous, tergite I with few sparse setae, deeply emarginate on posterior margin, covers more than three-fourth of gaster;

subgenital plate and ovipositor as in Figs. 206 and 210 respectively.

Female length: 3.34 mm.

Holotype: ♀, India, Uttar Pradesh, Aligarh, ex. *Chilo simplex* Butl. on *Zea mays* L., 1.vi.1979. (Cat. No. a-I).

Epitranus indicus sp.n.

(Figs. 163, 175, 181-182, 188, 199)

Female

Head predominantly black except ventral surface of frons, clypeus, eyes and ocelli being reddish, antennae reddish, pronotum and mesonotum reddish except apex of scutellum and a narrow strip anterior of propodeum dark, episternum black, legs reddish, petiole reddish, abdomen black.

Head.- Wider than long in facial view with fine sculpture and silvery white pubescence, pre orbital carinae distinct; inter-antennal lamellae present; clypeus rounded at apex; without sorebal depression; ocellin obtuse angled triangle, basal ocellus removed from eye rim by one and half

times its diameter, from occipital margin by more than three times its diameter.

Antennae (Fig. 163).- Scape short not exceeding front ocellus, five and one-half times as long as wide (0.65 : 0.12), as long as pedicel to 4th funicle segment combined; pedicel longer than wide; annellus distinctly wider than long, 1-3 funicle segments longer than wide, 4-7 subequare; club 2-segmented, more than twice longer than wide (0.3 : 0.14), as long as annellus and 1-2 funicle segments combined.

Thorax.- Densely pitted, pits narrow, finely carinate, with silvery white pubescence, propodeum with distinct carinae (Fig. 175).

Fore wings (Fig. 181).- Hyaline almost glabrous, about three times as long as wide, stigmal well formed, makes an angle of 45° with the wing margin (Fig. 182).

Hind legs.- Shagreened with silvery white pubescence, with fine sculpture, femora more more than twice as long as wide, outer-ventral margin with a basal robust tooth, followed by a second short tooth (Fig. 186).

Petiole.- Four times as long as wide.

Gaster (Fig. 198).- Sub acuminate at apex, densely sculptured with very few scattered setae; tergite I covers three-fourth surface of gaster.

Female length.- 3.65 mm.

Holotype ♀ , India, Uttar Pradesh, Aligarh, ex. Leucinodes orbonalis L. on Solanum melongena L., 10.ii.1979. (Cat. No. a-4).

Epitranus melongenae sp.n.
(Figs. 164, 176, 189,199)

Female:

Head black except clypeus and ventral region of frons being reddish, eyes and ocelli brown; pronotum reddish yellow, mesonotum and propodeum dark brown, tegulae reddish, hind coxae black at basal two-third, apex reddish brown, hind femora blackish brown, tibiae and tarsi orange yellow; petiole reddish brown; abdomen black.

Head.- Wider than long, with silvery white pubescence; scrobe cavity unexcavated, transversely rugose; pre-orbital carinae distinct, fronto-genal sutures obsolete; clypeus rounded at apex; inter-antennal lamellae distinct; ocelli

in obtuse angled triangle, basal ocellus away from eye rim by twice and from occipital margin by four times its diameter.

Antennae (Fig. 164).- Scape not-exceeding to front ocellus, seven times as long as wide (0.42 : 0.06), as long as pedicel to 5th funicle segment combined; pedicel longer than wide (0.07 : 0.05); 1-2 funicle longer than wide, 3-7 as long as wide; club 2-segmented, more than twice as long as wide (0.22 : 0.09) as long as annellus to 3rd funicle segment combined.

Thorax.- Densely pitted with finely carinated interspaces, with silvery white pubescence, pits comparatively more wider on scutellum, propodeum with distinct carinae (Fig. 176).

Fore wings.- Hyaline, almost glabrous, less than three times as long as wide (1.7 : 0.63); stigmal vein well developed, makes an angle of 45° with the wing margin.

Hind wings.- Hyaline three and a half times as long as wide.

Hind legs.- Coxae finely sculptured, coxae and femora densely pubescent, femora slightly more than twice as long as

wide, outer ventral margin with a basal robust tooth followed by 8 teeth (Fig. 189).

Gaster (Fig. 199).- Accuminate at apex, almost glabrous, minutely densely punctured, tergite I covers more than 3/4 of gaster; ovipositor exserted.

Female length: 2.45 mm.

Holotype: ♀, India, Uttar Pradesh, Aligarh, ex. Leucinodes orbonalis L., on Solanum melongena L., 6.xii.1979. (Cat. No. a-5).

Anitrama gigantiana sp.n.
(Figs. 167, 177, 190, 202)

Female

Head reddish except eyes, ocelli and occipital region brownish black, antennae reddish; thorax ferruginous, propodeum red except areola al dark, legs reddish, petiole reddish brown, abdomen black.

Head.- Wider than long in facial view, wider than thorax, with silvery white pubescence: pre orbital carinae

distinct, fronto-genal sutures indistinct; scrobe cavity unexcavated; clypeus rounded at apex with distinct inter-antennal lamellae; ocelli oin obtuse angled triangle, basal ocellus away from eye rim by one and a half times and from occipital margin by about three times its diameter.

Antennae (Fig. 167).- Scape short not exceeding to frontal ocelli, seven and a half times as long as wide (0.60: 0.08), as long as pedicel to 4th funicle segment combined, pedicel longer than wide; annellus transverse; funicle I about twice as long as wide, 2-7 distinctly longer than wide; club 2-segmented, less than three times as long as wide (0.32 : 0.13), as long as annellus and following two funicle segments combined.

Thorax.- Densely pitted, pits with narrow, finely carinated interspaces, with silvery white pubescense; propodeum with submedian carinae slightly distinct (Fig. 177).

Fore wings.- Hyaline, almost glabrous, slightly less than three times as long as wide (2.25 : 0.76); stigmal identical, makes an angle of 45° with the wing margin.

Hind wings.- Hyaline, about four times as long as wide.

Hind legs.- Coxae densely pitted on ventral surface coxae and femora thickly pubescent; femora nearly twice as long as wide, outer-ventral margin with 13 teeth (Fig. 190).

Petiole.- Slightly less than three times as long as wide.

Gaster (Fig. 202).- Accuminate at apex, almost glabrous tergite I covers about 2/3 of gaster; ovipositor concealed.

Female length: 4.10 mm.

Holotype: ♀, India, Uttar pradesh, Aligarh, ex. Leucinodes orbonalis L., on Solanum melongena L., 8.xii.1979. (Cat. No. C-2).

Enitranna similenna sp.n.
(Figs. 168, 178, 191, 200)

Female

Head reddish, eyes and ocelli brown, antennae reddish yellow, thorax reddish, propodeum reddish brown, legs reddish, hind coxae and hind femora slightly brown; petiole reddish, abdomen reddish, somewhat dark on dorsum.

Head.- Wider than long in facial view, wider than thorax, with silvery white pubescence; pre orbital carinae distinct, fronto-genal sutures indistinct, clypeus rounded at apex, inter-antennal lamellae distinct; ocelli in obtuse angled triangle, basal ocellus removed from eye rim by more than its diameter and from occipital margin by thrice its diameter.

Antennae (Fig. 168).- Scape short, not exceeding to front - ocellus, six times as long as wide (0.39: 0.07), shorter than pedicel to 5th funicle segment combined; pedicel one and one-half longer than wide(0.09 : 0.06); annellus transverse; 1-2 funicle longer than wide, 3-7 as long as wide; club 2-segmented, less than three times as long as wide (0.21 : 0.09) as long as annelus and following three funicle segments combined.

Thorax.- Densely pitted with shallow and compactly arranged pits; interspaces of pits very narrow, finely carinate; propodeum with distinct submedian carinae and areola 04.

Fore wings.- Hyaline, almost glabrous, less than three times as long as wide (1.85 : 0.64); stigmal identical makes a 45° angle with the wing margin.

Hind legs.- Coxae densely pitted on ventral surface, coxae and femora with dense pubescence, femora (Fig. 191) less than twice as long as wide, outer-ventral margin with a robust tooth, following 8 short teeth, second tooth shorter.

Petiole.- Four and a half times as long as wide.

Gaster (Fig. 200).- Sub acuminate at apex, almost glabrous with few sparse setae, tergite I covers two-third of gaster; ovipositor concealed.

Female length: 2.9 mm.

Holotype: ♀, India, Uttar Pradesh, Aligarh, ex. Chila simplex Butl., on Zea mays L., 10.vi. 1979. (Cat. No.a-7).

Baitrasma arcolatum sp.n.

(Figs. 169,171, 179, 183, 192, 203, 207,211)

Female:

Head reddish, scrobe cavity, occipital region and eyes brown, antennae reddish, pronotum reddish, mesonotum and propodeum light brown, tegulae reddish, legs and petiole reddish brown, abdomen dark brown with base reddish brown.

Head.- Wider than long in facial view, distinctly wider than thorax, with silvery white pubescence, pre orbital lamellae present; fronto-genal sutures obsolete, scrobe cavity shallow, without distinct margins, not exceeding to front-ocellus, ocelli in obtuse angled triangle, basal ocellus removed from eye margin by twice of its diameter and from occipital margin by three times of its diameter, mandibles bidentate.

Antennae (Fig. 169).- Scape not exceeding to front-ocellus, seven times as long as wide (0.53 : 0.080), as long as pedicel and 1-4 funicle segments combined; pedicel slightly longer than wide; annelus twice wider than long, first funicle one and a half times as long as wide, funicle segments longer than wide, decrease in length distad; club 3-segmented, more than twice as long as wide (0.27 : 0.11), less than annelus and 1-3 funicle segments combined.

Thorax.- Moderately pitted with interspaces narrow than their diameter, pubescence silvery white; propodeum without tooth on lateral costae, with distinct submedian, lateral and accessory carinae (Fig. 179).

Fore wings.- Hyaline, almost glabrous less than three times as long as wide (2.0 : 0.75) marginal shorter than sub-marginal, postmarginal absent stigmal well developed, makes an

angle of 45° with the marginal (Fig. 183).

Hind wings.- Hyaline, less than four times as long as wide, marginal fringe one-sixth of wing width.

Hind legs.- With pubescence of silvery white hairs femora (Fig. 192) one and half as long as wide, outer ventral margin with a robust tooth following 9 teeth.

Petiole.- Four times as long as wide, with 4 longitudinal carinae on dorsal surface.

Gaster (Fig. 203).- Accuminate at apex, almost glabrous, tergite I covers more than 3/4 of gaster: subgenital plate and ovipositor as in figs. 207 and 211.

Female length: 3.56 mm.

Male:

Resembles female but differs from it in the following characters:

Antennae (Figs. 171).- Scape short five times as long as wide, (0.39 : 0.08), as long as pedicel to half of 2nd funicle segments combined, pedicel slightly longer than wide, annelius

transverse, first funicle more than two times as wide, second less than twice, third one and a half times, 4-7 longer than wide; club 3-segmented, three times as long as wide, as long as annellus to half of second segment combined.

Male length: 3.35 mm.

Holotype: ♀, ♂, India, Uttar Pradesh, Aligarh, ex. *Leucinodes orbonalis* L. on *Solanum melongena* L., 8.viii.1979. (Cat. No. a-3).

Paratypes: 2 ♀♀, ♂ (Data same as for holotype).

Baltrama rossiensema sp.n.

(Figs. 170, 193, 201)

Female

Head reddish except eyes brown, ocelli yellowish; occipital region dark, antennae reddish; pronotum reddish, mesonotum reddish, somewhat dark on scutum and scutellum, propodeum dark in the centre, legs reddish, hind coxae and hind femora somewhat brown on dorsal surface; abdomen reddish.

Head.- Wider than long in facial view, distinctly wider than thorax, fairly sculptured with silvery white pubescence;

pre-orbital carinae distinct, fronto-genal sutures indistinct; unexcavated scrobe cavity; clypeus rounded at apex with distinct inter-antennal lamellae; ocelli in obtuse angled triangle, basal ocellus removed from eye rim by about one and a half times and from occipital margin by about three times its diameter.

Antennae (Figs. 170).- Scape short not exceeding to front-ocellus seven times as long as wide (0.47 : 0.07), shorter than pedicel to 5th funicle segment combined; annellus distinctly transverse, 1-2 funicle longer than wide, 3-6 as long as wide, 7th wider than long; club more than twice as long as wide (0.23 : 0.1), as long as annellus to 3rd funicle segment combined.

Thorax.- Densely pitted with very narrow and carinate interspaces; shagreened with silvery white pubescence; propodeum with submedian carinae reunite with the cell articulation, areola 04 long and reaches the apophysis, a-8 comparatively reduced .

Fore wings.- Hyaline, almost glabrous, slightly less than three times as long as wide (1.71 : 0.58); stigmal vein identical, makes an angle of 45° with the wing margin.

Hind wings.- Hyaline four times as long as wide.

Hind legs.- Coxae and femora finely sculptured, with silvery white pubescence, femora (Fig. 195) less than twice as

marginal (0.08 : 0.55), stigmal very short (0.035) (Fig. 99), marginal fringe short.

Hind wings.- Hyaline, less than four times as long as wide; marginal fringe short.

Fore legs.- Coxae black, femora and tibiae dark brown except at apex and base, apex and base of femora and tibiae and tarsi reddish brown.

Middle legs.- Coloration same as on fore legs.

Hind legs.- Coxae, femora, dark brown, tibiae and tarsi reddish brown; ventral side of xcoxae and femora fairly rough owing to distinct dense reticulations or striations, densely pubescent, ventral margin without distinct lobe, apical half with distinct, truncated teeth (Fig. 101).

Gaster (Fig. 107).- Black, almost as long as thorax, tergite I occupies one-third of gaster, almost glabrous, base with short but distinct carina on each side of median fovea, carinae as long as fovea, posterior margin of fovea weakly rounded, tergite II with very few sparse setae, 3-6 tergites, sparsely setose on posterior margin, last tergite densely setose; subgenital plate with lateral lobes in anterior margin, posterior margin with a deep notch in the middle; outerplates of ovipositor narrow at base, narrowly rounded at apex, with

PLATE - XXIII

(Figs. 156 - 166)

156. Epitrema acuminatus sp.n. : Head (Facial view), ♀

157. " " sp.n. : Head (Dorsal view), ♀

158. " " sp.n. : Head (Lateral view), ♀

159. E. verticellus sp.n. : Antenna, ♀

160. E. kashmiriensis sp.n. : Antenna, ♀

161. E. nigrus sp.n. : Antenna, ♀

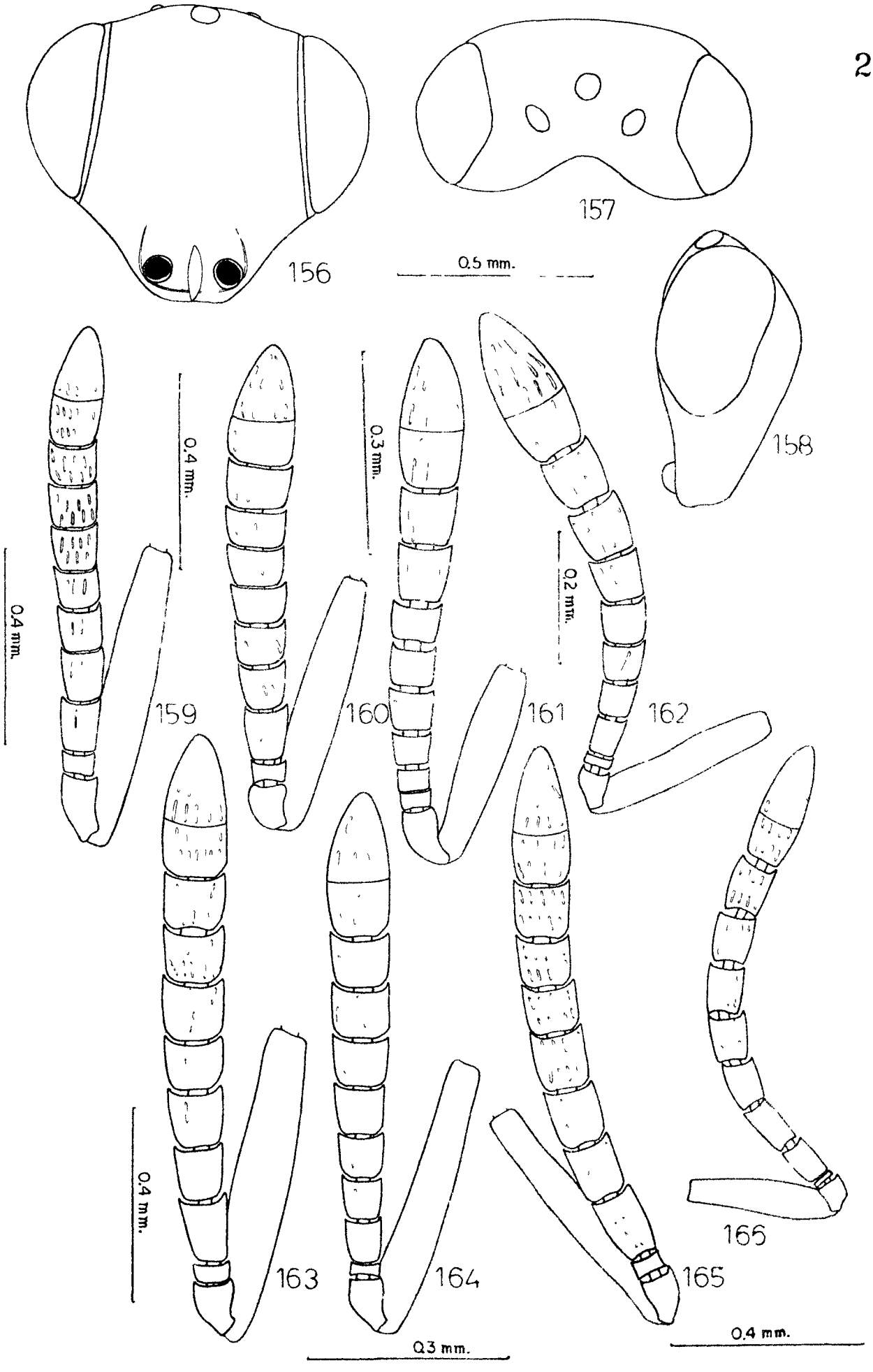
162. E. acuminatus s.n. : Antenna, ♀

163. E. indicus sp.n. : Antenna, ♀

164. E. E. melanostoma sp.n. : Antenna, ♀

165. E. kashmiriensis s.n. : Antenna, ♂

166. E. nigrus sp.n. : Antenna, ♂


156
157
0.5 mm.
158
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0.3 mm.
0.2 mm.
0.4 mm.
159
160
161
162
0.4 mm.
163
164
165
165
0.3 mm.
0.4 mm.

PLATE - XXIV

(Figs. 167-177)

167. Epitrema gigantica sp.n. : Antenna, ♀

168. E. simplexa sp.n. : Antenna, ♀

169. E. areolatus sp.n. : Antenna, ♀

170. E. rossicornus s.n. : Antenna, ♀

171. E. areolatus sp.n. : Antenna, ♂

172. E. verticellus sp.n. : Part of propodeum, ♀

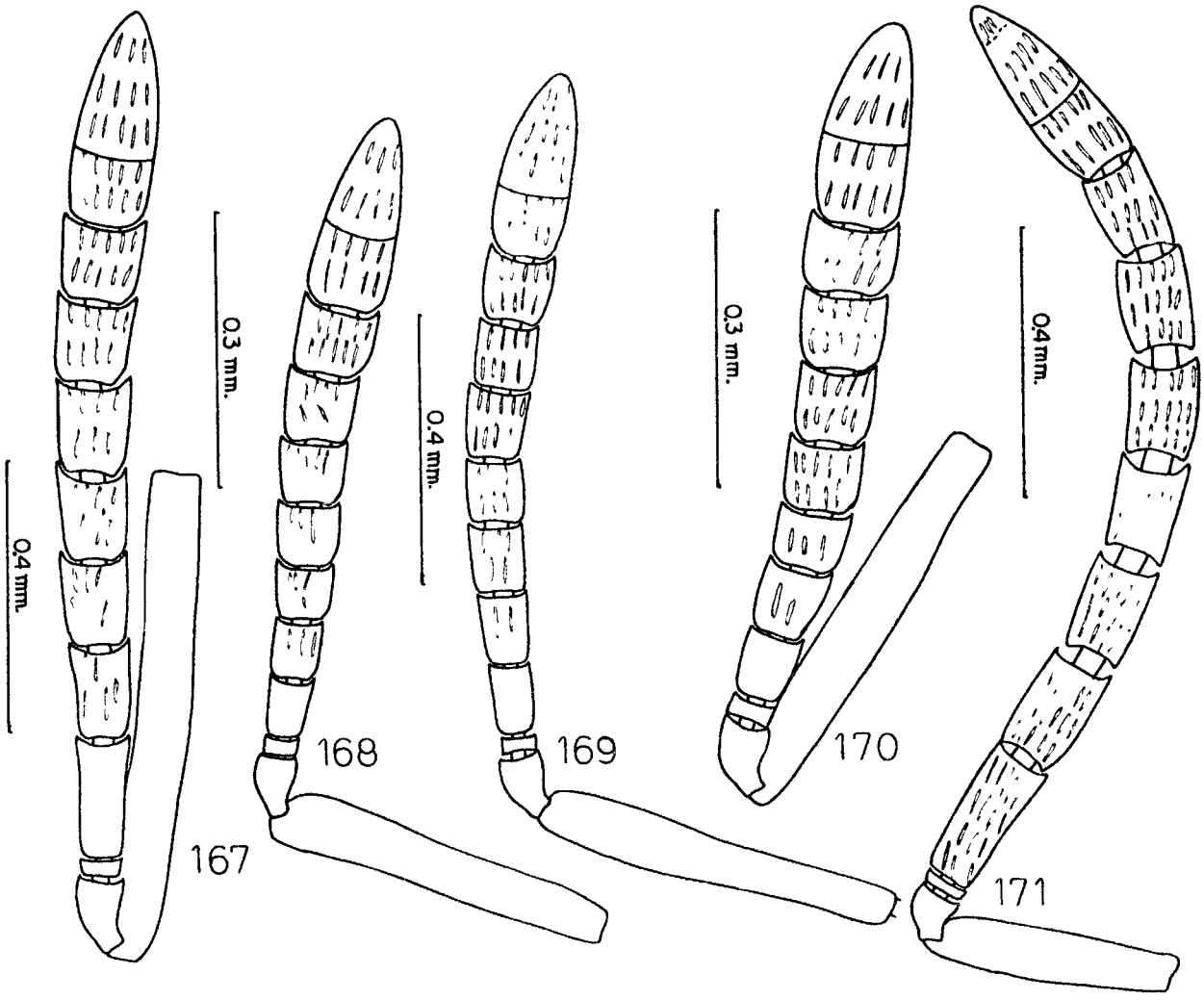
173. E. kashmirensis sp.n. : Part of propodeum, ♀

174. E. acuminatus sp.n. : Part of propodeum, ♀

175. E. indicus sp.n. : Part of propodeum, ♀

176. E. melanocornus sp.n. : Part of propodeum, ♀

177. E. gigantica sp.n. : Part of propodeum, ♀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167
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168
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169
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170
171

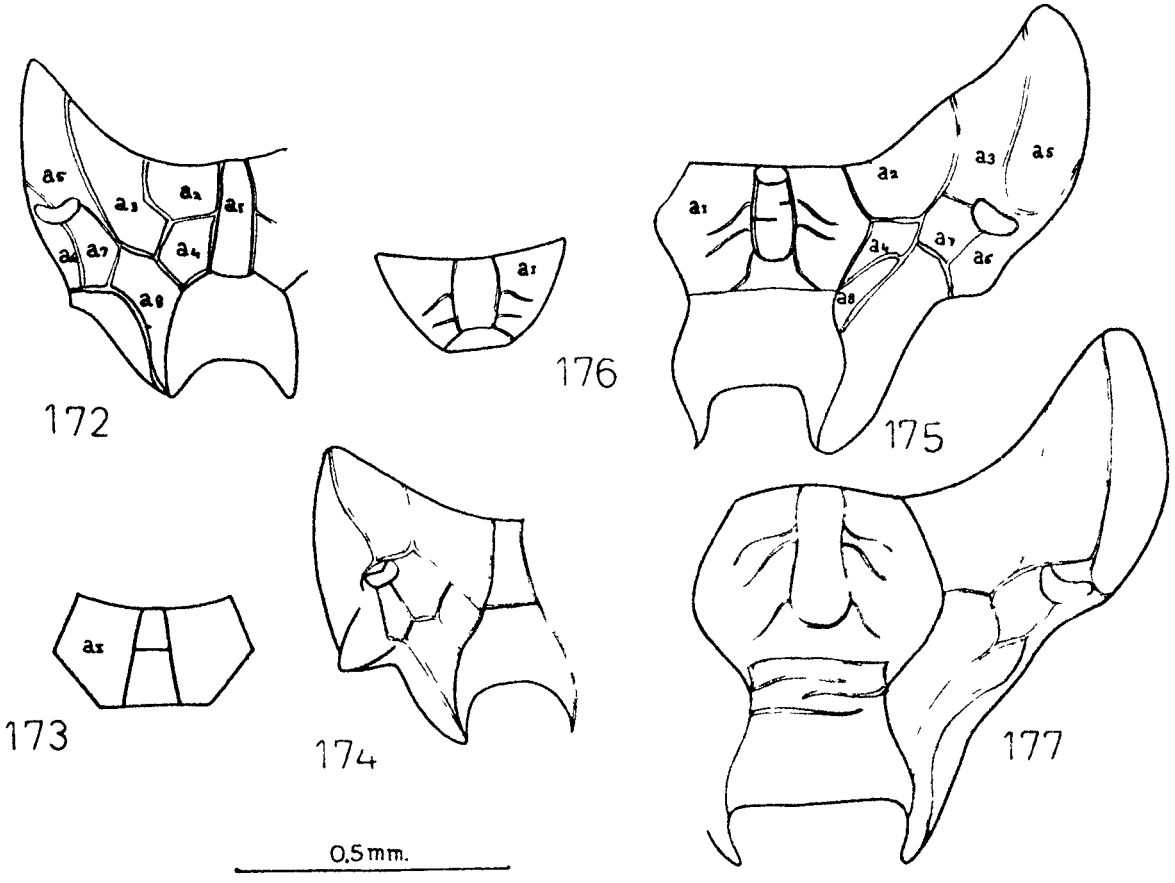

a6
a3
a2
a1
a5
a4
a7
a8
172
a1
176
a1
a2
a3
a5
a4
a7
a6
a8
175
a1
173
174
177
0.5 mm.

PLATE - XXV

(Figs. 178-185)

178. Enitremus simplexus sp.n. : Part of propodeum. ♀

179. E. arcolatus sp.n. : Part of propodeum. ♀

180. E. nigrus sp.n. : Part of venation of forewing. ♀

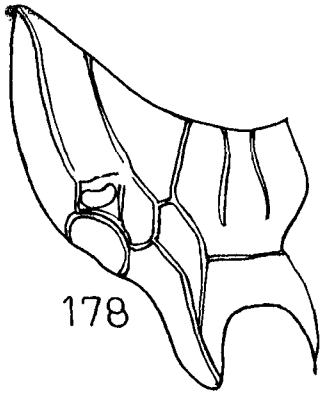
181. E. indicus sp.n. : Forewing. ♀

182. E. indicus sp.n. : Part of venation of forewing. ♀

183. E. arcolatus sp.n. : Part of venation of forewing. ♀

184. E. verticellus sp.n. : Hind femur and tibia. ♀

185. E. kashmirensis sp.n. : Hind femur and tibia. ♀



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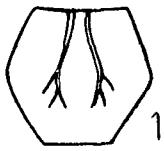
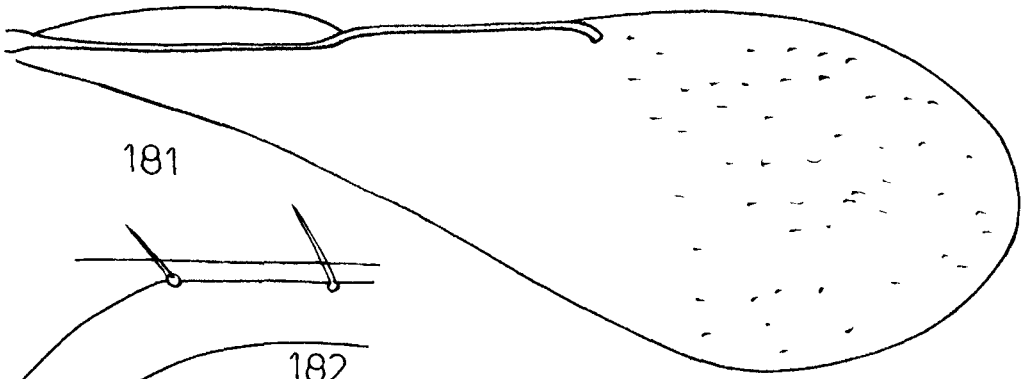


179

0.5 mm.



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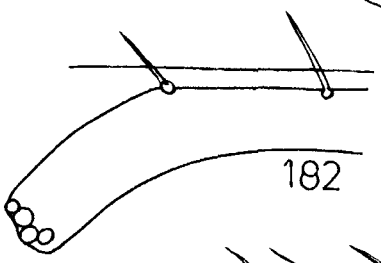
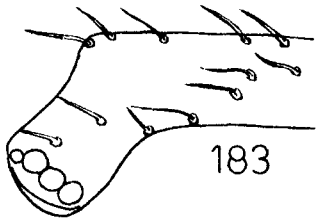


182

0.7 mm.



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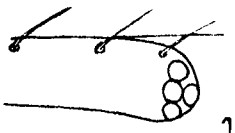
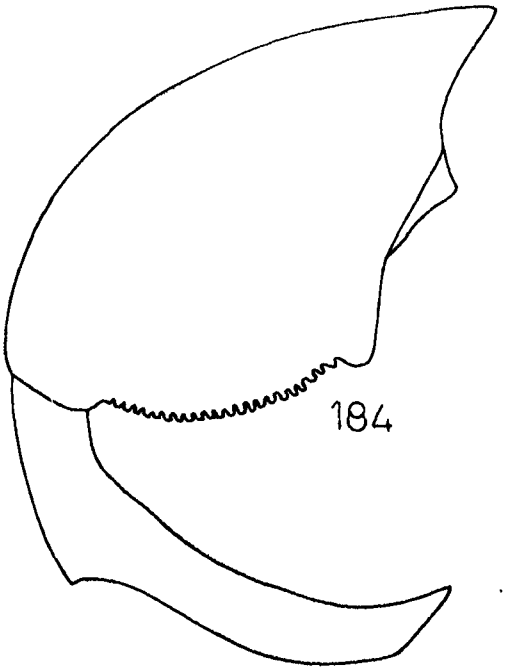


180

0.05 mm.



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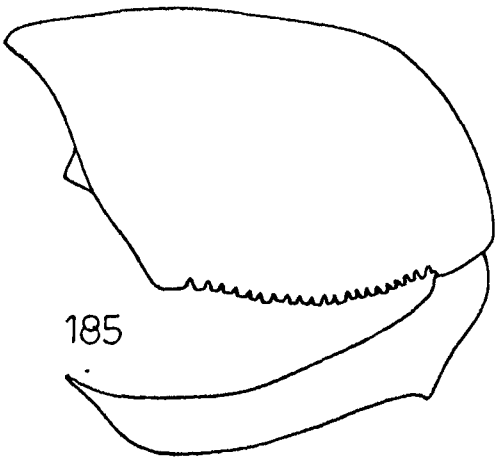


185

0.5 mm.

PLATE - XXVI

(Figs. 186 - 191)

186. Epitrema nigrus sp.n. : Hind femur and tibia, ♀

187. E. acuminatus sp.n. : Hind femur and tibia, ♀

188. E. indicus sp.n. : Hind femur and tibia, ♀

189. E. melanocerus sp.n. : Hind femur and tibia, ♀

190. E. gigantimus sp.n. : Hind femur and tibia, ♀

191. E. simplexus sp.n. : Hind femur and tibia, ♀

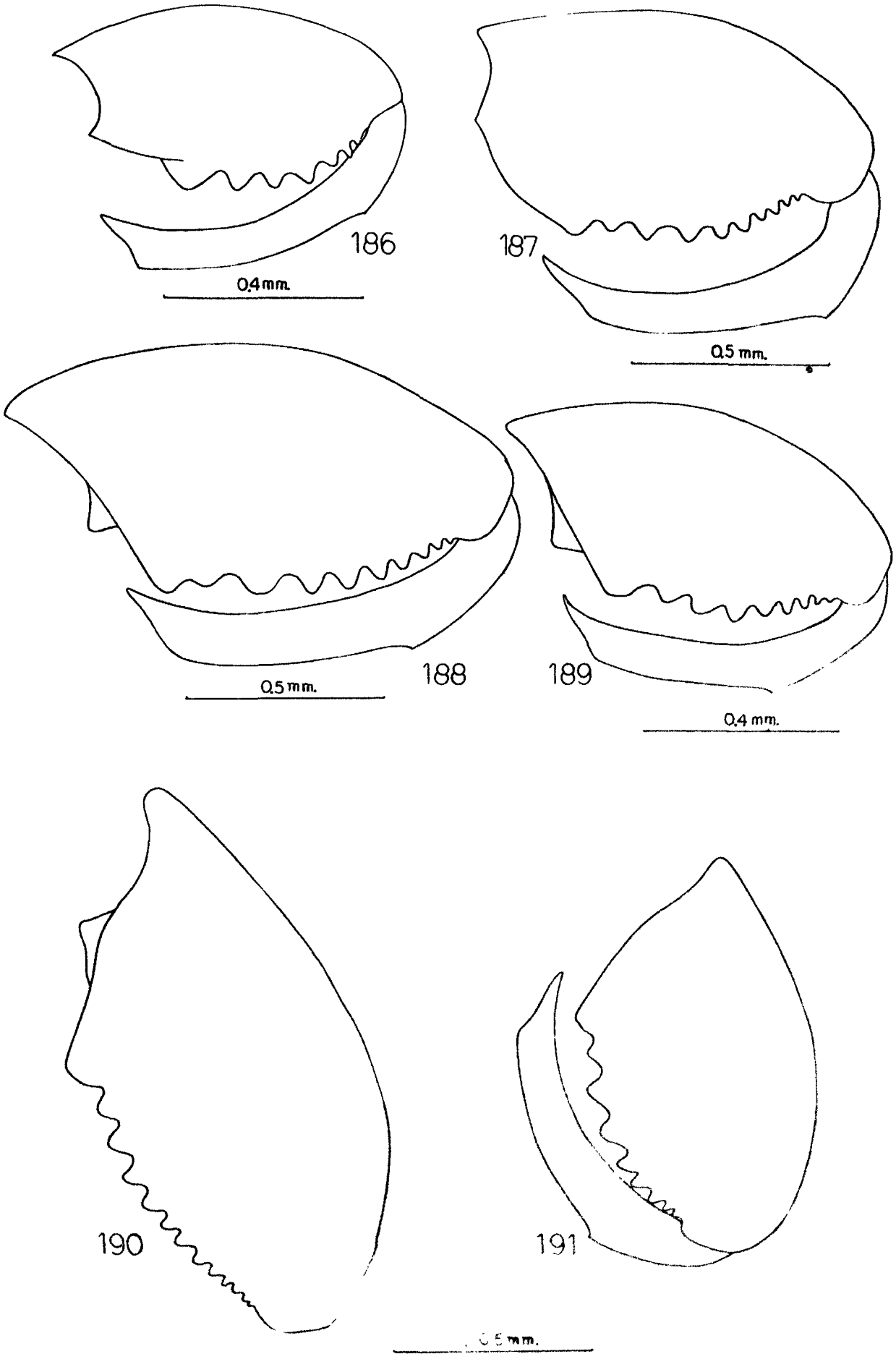

186
0.4 mm.
187
0.5 mm.
188
0.5 mm.
189
0.4 mm.
190
191
0.5 mm.

PLATE - XXVII

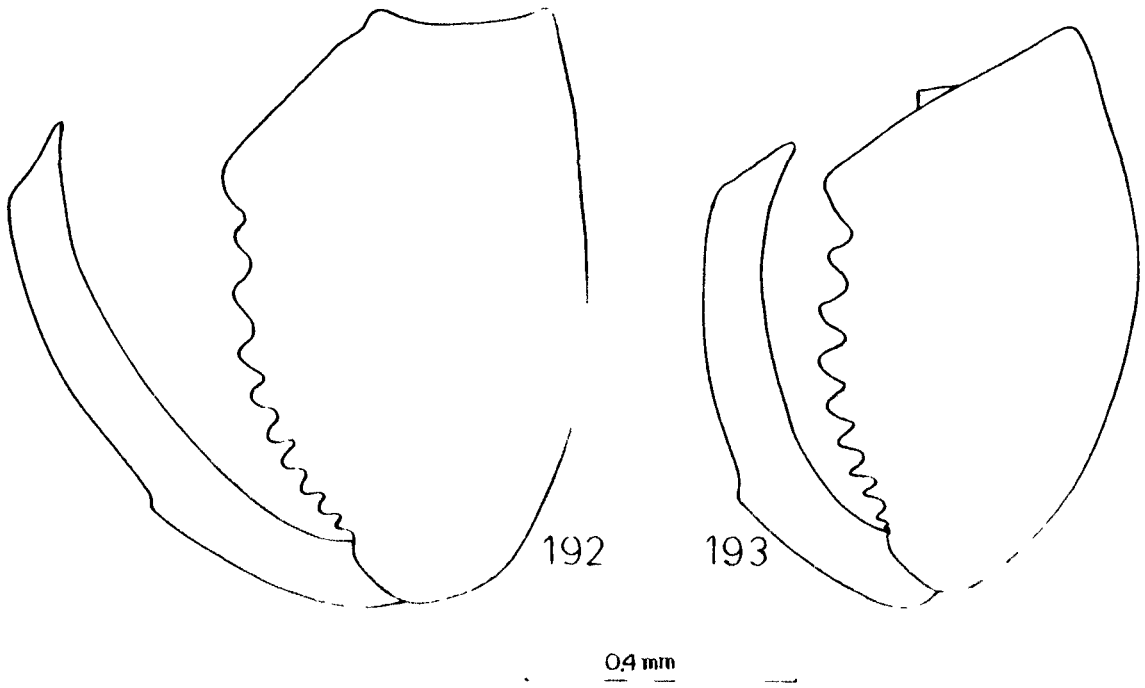
(Figs. 192-195)

192. Epitrenus arcolatus sp.n. : Hind femur and leg. ♀

193. E. rossicornus sp.n. : Hind femur and leg. ♀

194. E. verticellus sp.n. : Gaster. ♀

195. E. kashmiriensis sp.n. : Gaster. ♀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193
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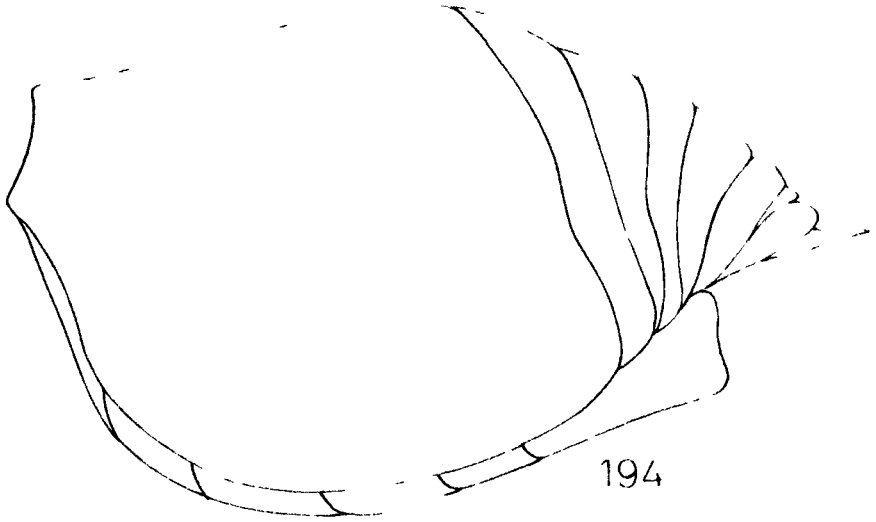
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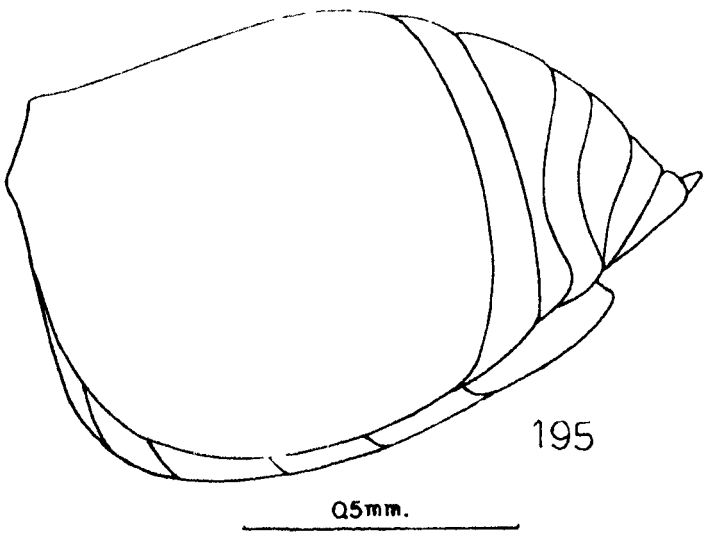

195
0.5mm.

PLATE - XXVIII

(Figs. 196-201)

196. Epitreamus nigrus sp.n. : Gaster, ♀

197. E. acuminatus sp.n. : Gaster, ♀

198. E. indicus sp.n. : Gaster, ♀

199. E. melongenus sp.n. : Gaster, ♀

200. E. simplexus sp.n. : Gaster, ♀

201. E. rossicoxrus sp.n. : Gaster, ♀

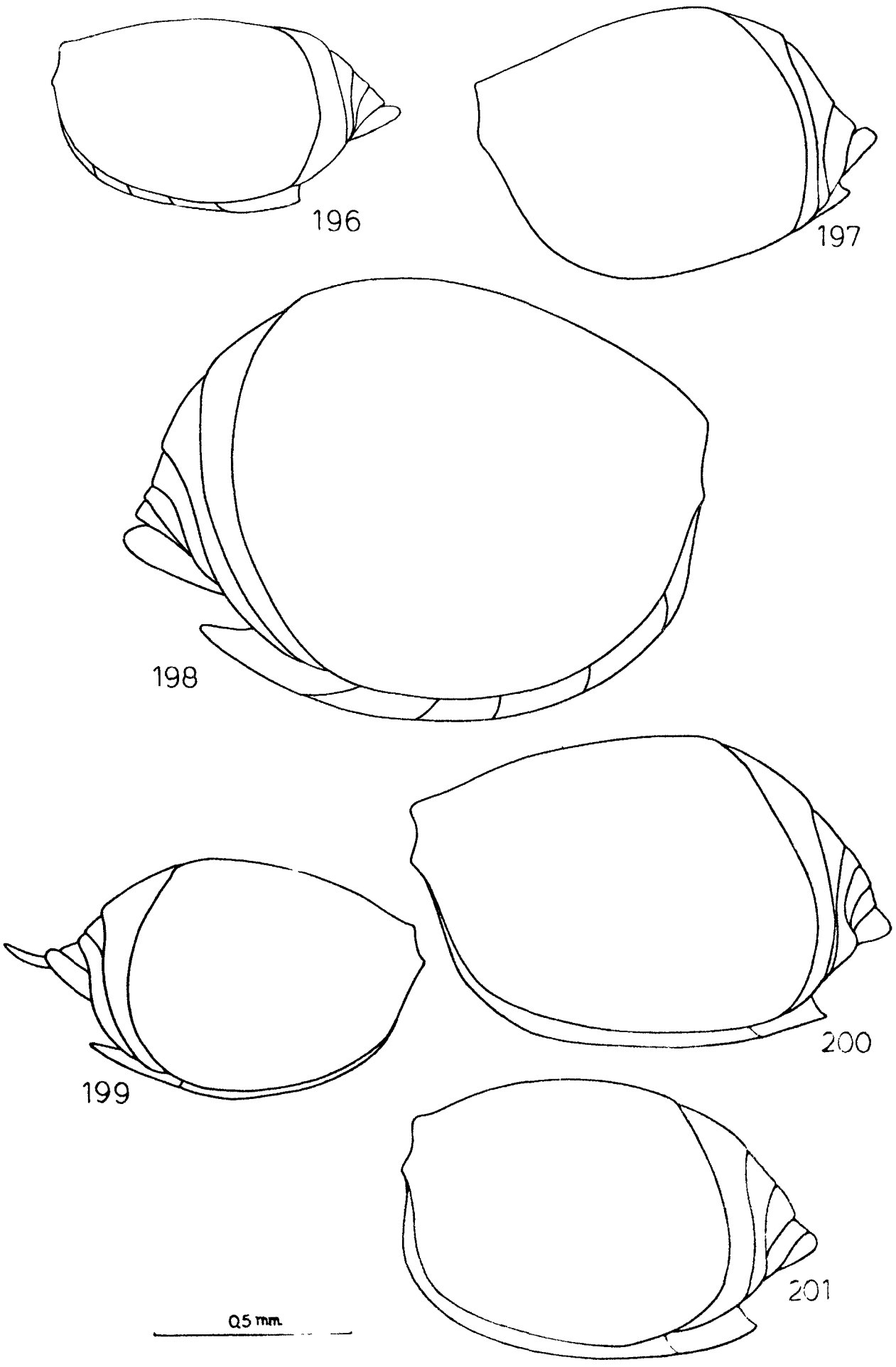
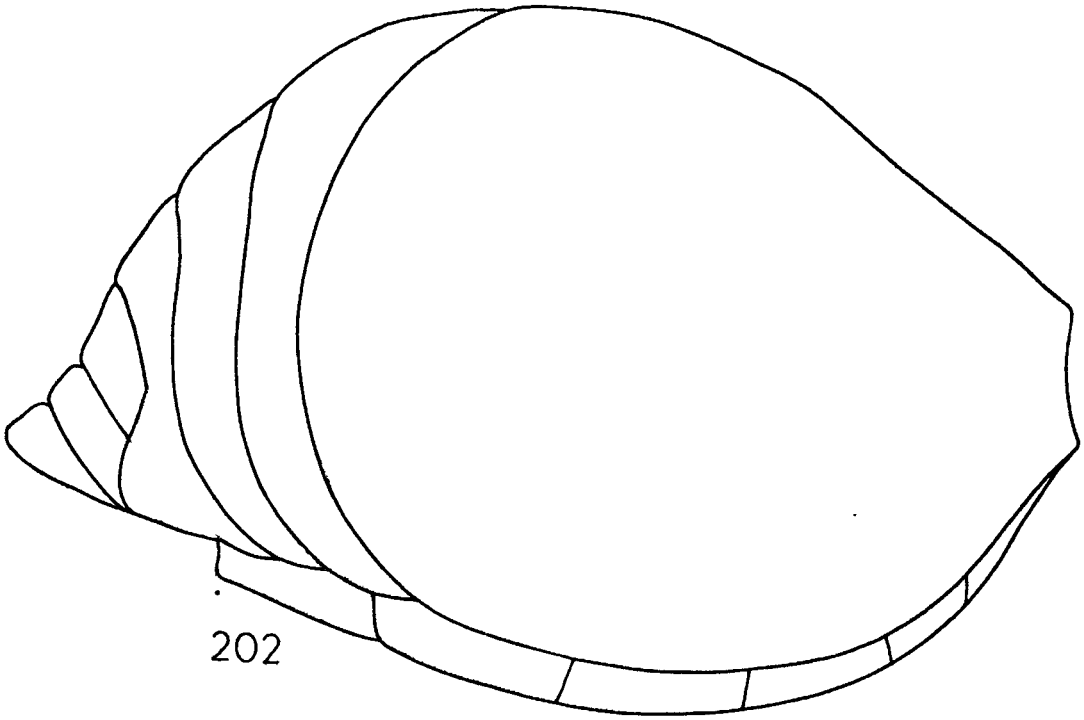

196
197
198
199
200
201
0.5 mm

PLATE - XXIX

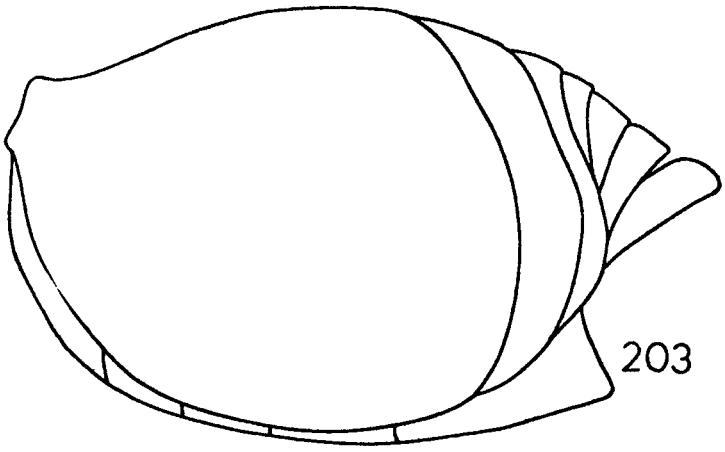
(Figs. 202 - 203)

202. Entimus siccaticus sp.n. : Gantor. ♀

203. E. exsolatus sp.n. : Gantor. ♀



202



203

0.5 mm.

PLATE - XXX

(Figs. 204 - 211)

204. Epitrausus kashmirienais sp.n. : Subgenital plate

205. E. nigrus sp.n. : Subgenital plate

206. E. acuminatus sp.n. : Subgenital plate

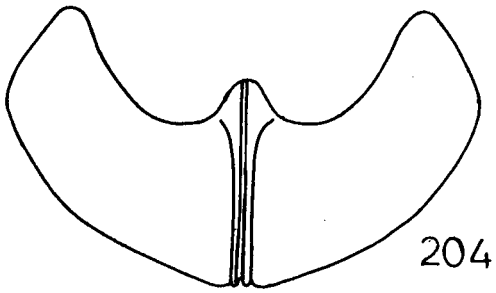
207. E. areolatus sp.n. : Subgenital plate

208. E. kashmirienais sp.n. : Ovipositor

209. E. nigrus sp.n. : ovipositor

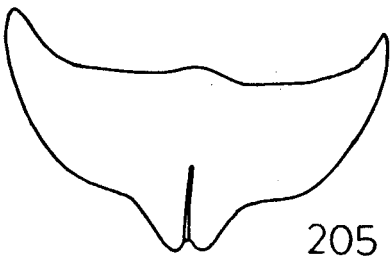
210. E. acuminatus sp.n. : Ovipositor

211. E. areolatus sp.n. : Ovipositor

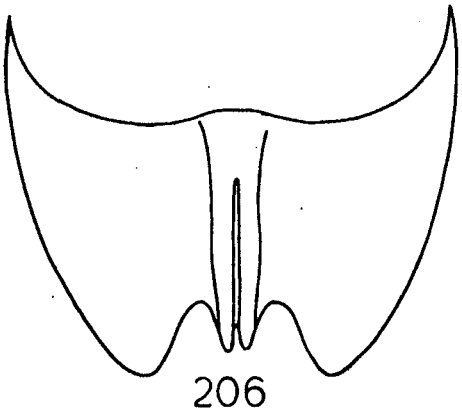


204

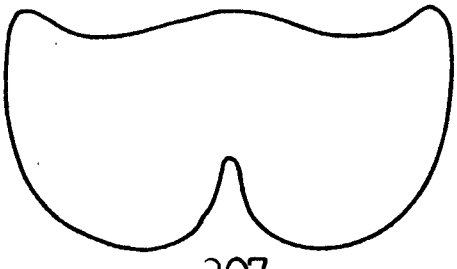
0.7 mm.



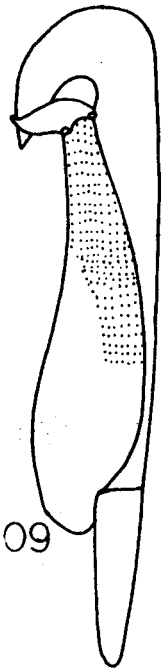
205



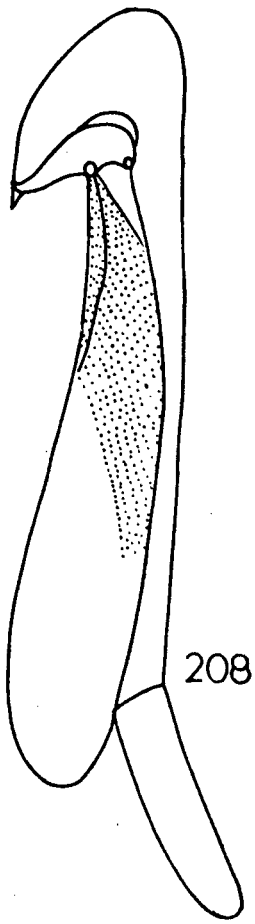
206



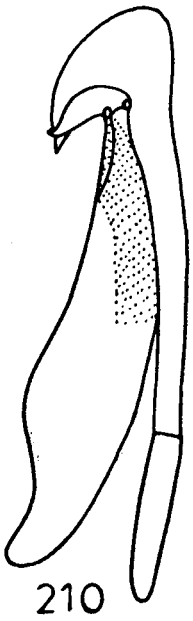
207



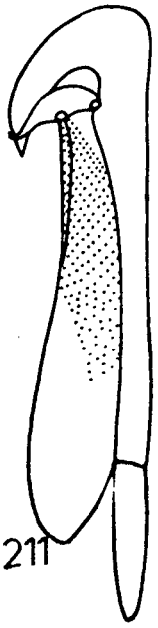
209



208



210



211

0.4 mm.

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